``

BAB 6

KESIMPULAN DAN SARAN

6.1. Kesimpulan

Melalui proses penelitian yang telah dilakukan diperoleh beberapa kesimpulan adalah sebagai berikut:

1. Masukan dari penelitian ini berasal dari keinginan pelanggan *(customer requirement)* yang diperoleh melalui proses wawancara dengan pengguna *sprayer* gendong semi-otomatis. Keinginan dari pelanggan tersebut adalah sebagai berikut:
   a) Alat harus mempunyai penggunaan tenaga yang efisien, sehingga operator tidak menderita kelelahan fisik setelah penggunaan alat.
   b) Kualitas semprot sesuai standar dan dapat menjangkau jarak 6 meter secara horisontal.
   c) Alat harus mudah digunakan
   d) Mempunyai perawatan yang mudah, mudah dibongkar pasang dan mempunyai suku cadang yang mudah didapat di pasaran.
   e) Alat mampu digunakan untuk penyemprotan selama 5 jam.
   f) Mempunyai harga yang murah dengan kisaran harga Rp 400.000,00 - Rp 600.000,00.

2. Penelitian dilakukan dengan menggunakan kombinasi metode QFD dan TRIZ dengan output berupa ide kreatif berdasarkan *40 inventive principle* yang menjadi

acuan peneliti dalam merancang produk. Ide-ide tersebut adalah sebagai berikut:

a) Tali-tali pengencang tangki pada tas dan tali gendong bisa diatur sesuai kebutuhan operator.
b) Menggunakan tangki berkapasitas besar (20L).
c) Membuat alat yang disertai panduan manual operasi.
d) Membatasi tanggungan beban bawaan operator secara instruktif sesuai standar, dan melakukan aksi periodik (membawa beban sebanyak satu tangki atau kurang dan mengisi bila habis secara berulang-ulang).
e) Menggunakan pipa besi sebagai rangka tas untuk mendapatkan kekuatan dari baja untuk menopang beban bawaan.
f) Mengganti sistem pompa mekanik dengan pompa listrik DC.
g) Menggunakan komponen standar *Sprayer* gendong semi-otomatis dan komponen pendukung yang sudah ada di pasaran.
h) Menggunakan tangki dari jerigen berbahan *High Density Polyethylene (HDPE)*.
i) Membuat alat yang mudah dibongkar-pasang, memisahkan komponen-komponen yang ada dan menyatukannya dengan penghubung (*connector & adaptor*).

Rancangan akhir yang dibuat oleh peneliti berdasarkan implementasi hasil TRIZ adalah berupa gambar desain dan satu unit alat *sprayer* pupuk elektrik. Spesifikasi alat ini adalah sebagai berikut:

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1. Alat ini menggunakan pompa elektrik yang bekerja pada tegangan 12 volt arus searah dari aki motor yang berkapasitas 10 amperehour (AH).
2. Durasi penggunaan alat maksimum secara terus menerus adalah 3,12 jam pada debit minimum yaitu 10,67 ml/detik.
3. Tangki pupuk menggunakan jerigen berkapasitas 20 liter dengan pengisian maksimum hingga 17 liter.
4. Penopang berat tangki menggunakan rangka dari bahan pipa besi berdiameter 1/2” dengan ketebalan 1,2 mm yang dapat menahan beban 25 kg dengan aman.
5. Berat Kosong alat sebesar 7 Kg termasuk aki.
6. Dimensi *sprayer* panjang x lebar x tinggi adalah 356mm x 360mm x437mm.
7. Komponen *sprayer* menggunakan komponen standar yang mudah di dapat di pasaran.
8. Komponen *sprayer* terpisah dan dapat dirakit dengan perantara konektor standar sehingga memudahkan proses perawatan.
9. Tali-tali pengencang pada tangki dan juga tali gendong dapat di atur *(adjustable).*
10. *Sprayer* pupuk elektrik ini dibuat dengan total biaya sebesar Rp 617.200,00

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Gambar 4.2 *Sprayer* Pupuk Elektrik.

3. Pengujian *Sprayer* pupuk elektrik dilakukan dengan tujuan untuk mengetahui apakah *Sprayer* yang sudah dibuat dapat memenuhi permintaan pelanggan *(voice of customer)* dan juga mengetahui secara aktual jika ada kekurangan atau ketidaksempurnaan pada alat yang sudah dibuat. Hasil pengujian yang didapat dari penilaian lima orang responden pengujian menunjukkan hasil sebagai berikut.

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Tabel 4.5 Hasil Pengujian

No	Atribut	Hasil Pengujian Responden ke-					Keterangan
		1	2	3	4	5	
1	Penggunaan tenaga yang efisien	5	5	5	5	5	Tidak perlu memompa
2	Kualitas dan kemampuan Semprot yang baik	5	5	5	5	5	Kualitas semprot sama dengan srayer gendong semi-otomatis
							Bisa menjangkau area tengah sawah dengan jarak hingga 7 meter
3	Praktis digunakan	5	5	3	3	5	Penyemprotan bisa dilakukan dengan satu tangan
							Dapat menghidupkan pompa dan membuka katup dengan satu gerakan saja
4	Perawatan Mudah	5	5	5	5	5	komponen bisa di bongkar-pasang dengan mudah
							Isi-ulang aki mudah
							Komponen mudah dicari di pasaran
5	Punya durabilitas penggunaan yang baik	5	5	5	5	5	Bisa dipakai lebih dari 4 jam dengan tekanan konstan
6	Harga terjangkau	5	5	5	5	5	Harga masih bisa dijangkau pada kisaran Rp620.000,00

Dari hasil pengujian tersebut diemukan beberapa permasalahan terkai dengan kemudahan penggunaan alat. masalah yang pertama adalah diperlukannya penambahan skala volume kasar pada bagian tangki untuk mempermudah perkiraaan besar volume isi tangki. Permasalahan berikutnya adalah tentang penggunaan kapasitas tangki yang tidak maksimal terait dengan berat alat saat terisi penuh.

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6.2. Saran

Sprayer pupuk elektrik yang dibuat peneliti sudah memenuhi kebutuhan pelanggan namun, akan lebih bagus jika dilakukan penelitian lebih lanjun mengenai metode pembawaan alat dan juga ergonomi *sprayer* ini.

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Worsening Feature / Improving Feature		Weight of moving object	Weight of stationary object	Length of moving object	Length of stationary object	Area of moving object	Area of stationary object	Volume of moving object
		1	2	3	4	5	6	7
1	Weight of moving object	+		15, 8, 29,34		29, 17, 38, 34		29, 2, 40, 28
2	Weight of stationary object		+		10, 1, 29, 35		35, 30, 13, 2	
3	Length of moving object	8, 15, 29, 34		+		15, 17, 4		7, 17, 4, 35
4	Length of stationary object		35, 28, 40, 29		+		17, 7, 10, 40	
5	Area of moving object	2, 17, 29, 4		14, 15, 18, 4		+		7, 14, 17, 4
6	Area of stationary object		30, 2, 14, 18		26, 7, 9, 39		+	
7	Volume of moving object	2, 26, 29, 40		1, 7, 4, 35		1, 7, 4, 17		+
8	Volume of stationary object		35, 10, 19, 14	19, 14	35, 8, 2, 14			
9	Speed	2, 28, 13, 38		13, 14, 8		29, 30, 34		7, 29, 34
10	Force (Intensity)	8, 1, 37, 18	18, 13, 1, 28	17, 19, 9, 36	28, 10	19, 10, 15	1, 18, 36, 37	15, 9, 12, 37
11	Stress or pressure	10, 36, 37, 40	13, 29, 10, 18	35, 10, 36	35, 1, 14, 16	10, 15, 36, 28	10, 15, 36, 37	6, 35, 10
12	Shape	8, 10, 29, 40	15, 10, 26, 3	29, 34, 5, 4	13, 14, 10, 7	5, 34, 4, 10		14, 4, 15, 22
13	Stability of the object's composition	21, 35, 2, 39	26, 39, 1, 40	13, 15, 1, 28	37	2, 11, 13	39	28, 10, 19, 39
14	Strength	1, 8, 40, 15	40, 26, 27, 1	1, 15, 8, 35	15, 14, 28, 26	3, 34, 40, 29	9, 40, 28	10, 15, 14, 7
15	Duration of action of moving object	19, 5, 34, 31		2, 19, 9		3, 17, 19		10, 2, 19, 30
16	Duration of action by stationary object		6, 27, 19, 16		1, 40, 35			
17	Temperature	36,22, 6, 38	22, 35, 32	15, 19, 9	15, 19, 9	3, 35, 39, 18	35, 38	34, 39, 40, 18
18	Illumination intensity	19, 1, 32	2, 35, 32	19, 32, 16		19, 32, 26		2, 13, 10
19	Use of energy by moving object	12,18,28 ,31		12, 28		15, 19, 25		35, 13, 18
20	Use of energy by stationary object		19, 9, 6, 27					
21	Power	8, 36, 38, 31	19, 26, 17, 27	1, 10, 35, 37		19, 38	17, 32, 13, 38	35, 6, 38
22	Loss of Energy	15, 6, 19, 28	19, 6, 18, 9	7, 2, 6, 13	6, 38, 7	15, 26, 17, 30	17, 7, 30, 18	7, 18, 23
23	Loss of substance	35, 6, 23, 40	35, 6, 22, 32	14, 29, 10, 39	10, 28,24	35, 2, 10, 31	10, 18, 39, 31	1, 29, 30, 36
24	Loss of Information	10, 24, 35	10, 35, 5	1, 26	26	30, 26	30, 16	

Improving Feature \ Worsening Feature		1 Weight of moving object	2 Weight of stationary object	3 Length of moving object	4 Length of stationary object	5 Area of moving object	6 Area of stationary object	7 Volume of moving object
25	Loss of Time	10, 20, 37, 35	10, 20, 26, 5	15, 2, 29	30, 24, 14, 5	26, 4, 5, 16	10, 35, 17, 4	2, 5, 34, 10
26	Quantity of substance/the matter	35, 6, 18, 31	27, 26, 18, 35	29, 14, 35, 18		15, 14, 29	2, 18, 40, 4	15, 20, 29
27	Reliability	3, 8, 10, 40	3, 10, 8, 28	15, 9, 14, 4	15, 29, 28, 11	17, 10, 14, 16	32, 35, 40, 4	3, 10, 14, 24
28	Measurement accuracy	32, 35, 26, 28	28, 35, 25, 26	28, 26, 5, 16	32, 28, 3, 16	26, 28, 32, 3	26, 28, 32, 3	32, 13, 6
29	Manufacturing precision	28, 32, 13, 18	28, 35, 27, 9	10, 28, 29, 37	2, 32, 10	28, 33, 29, 32	2, 29, 18, 36	32, 23, 2
30	Object-affected harmful factors	22, 21, 27, 39	2, 22, 13, 24	17, 1, 39, 4	1, 18	22, 1, 33, 28	27, 2, 39, 35	22, 23, 37, 35
31	Object-generated harmful factors	19, 22, 15, 39	35, 22, 1, 39	17, 15, 16, 22		17, 2, 18, 39	22, 1, 40	17, 2, 40
32	Ease of manufacture	28, 29, 15, 16	1, 27, 36, 13	1, 29, 13, 17	15, 17, 27	13, 1, 26, 12	16, 40	13, 29, 1, 40
33	Ease of operation	25, 2, 13, 15	6, 13, 1, 25	1, 17, 13, 12		1, 17, 13, 16	18, 16, 15, 39	1, 16, 35, 15
34	Ease of repair	2, 27 35, 11	2, 27, 35, 11	1, 28, 10, 25	3, 18, 31	15, 13, 32	16, 25	25, 2, 35, 11
35	Adaptability or versatility	1, 6, 15, 8	19, 15, 29, 16	35, 1, 29, 2	1, 35, 16	35, 30, 29, 7	15, 16	15, 35, 29
36	Device complexity	26, 30, 34, 36	2, 26, 35, 39	1, 19, 26, 24	26	14, 1, 13, 16	6, 36	34, 26, 6
37	Difficulty of detecting and measuring	27, 26, 28, 13	6, 13, 28, 1	16, 17, 26, 24	26	2, 13, 18, 17	2, 39, 30, 16	29, 1, 4, 16
38	Extent of automation	28, 26, 18, 35	28, 26, 35, 10	14, 13, 17, 28	23	17, 14, 13		35, 13, 16
39	Productivity	35, 26, 24, 37	28, 27, 15, 3	18, 4, 28, 38	30, 7, 14, 26	10, 26, 34, 31	10, 35, 17, 7	2, 6, 34, 10

Improving Feature \ Worsening Feature		Volume of stationary object	Speed	Force (Intensity)	Stress or pressure	Shape	Stability of the object's composition	Strength
		8	9	10	11	12	13	14
1	Weight of moving object		2, 8, 15, 38	8, 10, 18, 37	10, 36, 37, 40	10, 14, 35, 40	1, 35, 19, 39	28, 27, 18, 40
2	Weight of stationary object	5, 35, 14, 2		8, 10, 19, 35	13, 29, 10, 18	13, 10, 29, 14	26, 39, 1, 40	28, 2, 10, 27
3	Length of moving object		13, 4, 8	17, 10, 4	1, 8, 35	1, 8, 10, 29	1, 8, 15, 34	8, 35, 29, 34
4	Length of stationary object	35, 8, 2,14		28, 10	1, 14, 35	13, 14, 15, 7	39, 37, 35	15, 14, 28, 26
5	Area of moving object		29, 30, 4, 34	19, 30, 35, 2	10, 15, 36, 28	5, 34, 29, 4	11, 2, 13, 39	3, 15, 40, 14
6	Area of stationary object			1, 18, 35, 36	10, 15, 36, 37		2, 38	40
7	Volume of moving object		29, 4, 38, 34	15, 35, 36, 37	6, 35, 36, 37	1, 15, 29, 4	28, 10, 1, 39	9, 14, 15, 7
8	Volume of stationary object	+		2, 18, 37	24, 35	7, 2, 35	34, 28, 35, 40	9, 14, 17, 15
9	Speed		+	13, 28, 15, 19	6, 18, 38, 40	35, 15, 18, 34	28, 33, 1, 18	8, 3, 26, 14
10	Force (Intensity)	2, 36, 18, 37	13, 28, 15, 12	+	18, 21, 11	10, 35, 40, 34	35, 10, 21	35, 10, 14, 27
11	Stress or pressure	35, 24	6, 35, 36	36, 35, 21	+	35, 4, 15, 10	35, 33, 2, 40	9, 18, 3, 40
12	Shape	7, 2, 35	35, 15, 34, 18	35, 10, 37, 40	34, 15, 10, 14	+	33, 1, 18, 4	30, 14, 10, 40
13	Stability of the object's composition	34, 28, 35, 40	33, 15, 28, 18	10, 35, 21, 16	2, 35, 40	22, 1, 18, 4	+	17, 9, 15
14	Strength	9, 14, 17, 15	8, 13, 26, 14	10, 18, 3, 14	10, 3, 18, 40	10, 30, 35, 40	13, 17, 35	+
15	Duration of action of moving object		3, 35, 5	19, 2, 16	19, 3, 27	14, 26, 28, 25	13, 3, 35	27, 3, 10
16	Duration of action by stationary object	35, 34, 38					39, 3, 35, 23	
17	Temperature	35, 6, 4	2, 28, 36, 30	35, 10, 3, 21	35, 39, 19, 2	14, 22, 19, 32	1, 35, 32	10, 30, 22, 40
18	Illumination intensity		10, 13, 19	26, 19, 6		32, 30	32, 3, 27	35, 19
19	Use of energy by moving object		8, 35, 35	16, 26, 21, 2	23, 14, 25	12, 2, 29	19, 13, 17, 24	5, 19, 9, 35
20	Use of energy by stationary object			36, 37			27, 4, 29, 18	35
21	Power	30, 6, 25	15, 35, 2	26, 2, 36, 35	22, 10, 35	29, 14, 2, 40	35, 32, 15, 31	26, 10, 28
22	Loss of Energy	7	16, 35, 38	36, 38			14, 2, 39, 6	26
23	Loss of substance	3, 39, 18, 31	10, 13, 28, 38	14, 15, 18, 40	3, 36, 37, 10	29, 35, 3, 5	2, 14, 30, 40	35, 28, 31, 40
24	Loss of Information	2, 22	26, 32					

Worsening Feature / Improving Feature		Volume of stationary object	Speed	Force (Intensity)	Stress or pressure	Shape	Stability of the object's composition	Strength
		8	9	10	11	12	13	14
25	Loss of Time	35, 16, 32, 18		10, 37, 36,5	37, 36,4	4, 10, 34, 17	35, 3, 22, 5	29, 3, 28, 18
26	Quantity of substance/the matter		35, 29, 34, 28	35, 14, 3	10, 36, 14, 3	35, 14	15, 2, 17, 40	14, 35, 34, 10
27	Reliability	2, 35, 24	21, 35, 11, 28	8, 28, 10, 3	10, 24, 35, 19	35, 1, 16, 11		11, 28
28	Measurement accuracy		28, 13, 32, 24	32, 2	6, 28, 32	6, 28, 32	32, 35, 13	28, 6, 32
29	Manufacturing precision	25, 10, 35	10, 28, 32	28, 19, 34, 36	3, 35	32, 30, 40	30, 18	3, 27
30	Object-affected harmful factors	34, 39, 19, 27	21, 22, 35, 28	13, 35, 39, 18	22, 2, 37	22, 1, 3, 35	35, 24, 30, 18	18, 35, 37, 1
31	Object-generated harmful factors	30, 18, 35, 4	35, 28, 3, 23	35, 28, 1, 40	2, 33, 27, 18	35, 1	35, 40, 27, 39	15, 35, 22, 2
32	Ease of manufacture	35	35, 13, 8, 1	35, 12	35, 19, 1, 37	1, 28, 13, 27	11, 13, 1	1, 3, 10, 32
33	Ease of operation	4, 18, 39, 31	18, 13, 34	28, 13 35	2, 32, 12	15, 34, 29, 28	32, 35, 30	32, 40, 3, 28
34	Ease of repair	1	34, 9	1, 11, 10	13	1, 13, 2, 4	2, 35	11, 1, 2, 9
35	Adaptability or versatility		35, 10, 14	15, 17, 20	35, 16	15, 37, 1, 8	35, 30, 14	35, 3, 32, 6
36	Device complexity	1, 16	34, 10, 28	26, 16	19, 1, 35	29, 13, 28, 15	2, 22, 17, 19	2, 13, 28
37	Difficulty of detecting and measuring	2, 18, 26, 31	3, 4, 16, 35	30, 28, 40, 19	35, 36, 37, 32	27, 13, 1, 39	11, 22, 39, 30	27, 3, 15, 28
38	Extent of automation		28, 10	2, 35	13, 35	15, 32, 1, 13	18, 1	25, 13
39	Productivity	35, 37, 10, 2		28, 15, 10, 36	10, 37, 14	14, 10, 34, 40	35, 3, 22, 39	29, 28, 10, 18

Improving Feature \ Worsening Feature		Duration of action of moving object	Duration of action of stationary object	Temperature	Illumination intensity	Use of energy by moving object	Use of energy by stationary object	Power
		15	16	17	18	19	20	21
1	Weight of moving object	5, 34, 31, 35		6, 29, 4, 38	19, 1, 32	35, 12, 34, 31		12, 36, 18, 31
2	Weight of stationary object		2, 27, 19, 6	28, 19, 32, 22	19, 32, 35		18, 19, 28, 1	15, 19, 18, 22
3	Length of moving object	19		10, 15, 19	32	8, 35, 24		1, 35
4	Length of stationary object		1, 10, 35	3, 35, 38, 18	3, 25			12, 8
5	Area of moving object	6, 3		2, 15, 16	15, 32, 19, 13	19, 32		19, 10, 32, 18
6	Area of stationary object		2, 10, 19, 30	35, 39, 38				17, 32
7	Volume of moving object	6, 35, 4		34, 39, 10, 18	2, 13, 10	35		35, 6, 13, 18
8	Volume of stationary object		35, 34, 38	35, 6, 4				30, 6
9	Speed	3, 19, 35, 5		28, 30, 36, 2	10, 13, 19	8, 15, 35, 38		19, 35, 38, 2
10	Force (Intensity)	19, 2		35, 10, 21		19, 17, 10	1, 16, 36, 37	19, 35, 18, 37
11	Stress or pressure	19, 3, 27		35, 39, 19, 2		14, 24, 10, 37		10, 35, 14
12	Shape	14, 26, 9, 25		22, 14, 19, 32	13, 15, 32	2, 6, 34, 14		4, 6, 2
13	Stability of the object's composition	13, 27, 10, 35	39, 3, 35, 23	35, 1, 32	32, 3, 27, 16	13, 19	27, 4, 29, 18	32, 35, 27, 31
14	Strength	27, 3, 26		30, 10, 40	35, 19	19, 35, 10	35	10, 26, 35, 28
15	Duration of action of moving object	+		19, 35, 39	2, 19, 4, 35	28, 6, 35, 18		19, 10, 35, 38
16	Duration of action by stationary object		+	19, 18, 36, 40				16
17	Temperature	19, 13, 39	19, 18, 36, 40	+	32, 30, 21, 16	19, 15, 3, 17		2, 14, 17, 25
18	Illumination intensity	2, 19, 6		32, 35, 19	+	32, 1, 19	32, 35, 1, 15	32
19	Use of energy by moving object	28, 35, 6, 18	-	19, 24, 3, 14	2, 15, 19	+	-	6, 19, 37, 18
20	Use of energy by stationary object				19, 2, 35, 32	-	+	
21	Power	19, 35, 10, 38	16	2, 14, 17, 25	16, 6, 19	16, 6, 19, 37		+
22	Loss of Energy			19, 38, 7	1, 13, 32, 15			3, 38
23	Loss of substance	28, 27, 3, 18	27, 16, 18, 38	21, 36, 39, 31	1, 6, 13	35, 18, 24, 5	28, 27, 12, 31	28, 27, 18, 38
24	Loss of Information	10	10		19			10, 19

Improving Feature \ Worsening Feature		Duration of action of moving object	Duration of action of stationary object	Temperature	Illumination intensity	Use of energy by moving object	Use of energy by stationary object	Power
		15	16	17	18	19	20	21
25	Loss of Time	20, 10, 28, 18	28, 20, 10, 16	35, 29, 21, 18	1, 19, 26, 17	35, 38, 19, 18	1	35, 20, 10, 6
26	Quantity of substance/the matter	3, 35, 10, 40	3, 35, 31	3, 17, 39		34, 29, 16, 18	3, 35, 31	35
27	Reliability	2, 35, 3, 25	34, 27, 6, 40	3, 35, 10	11, 32, 13	21, 11, 27, 19	36, 23	21, 11, 26, 31
28	Measurement accuracy	28, 6, 32	10, 26, 24	6, 19, 28, 24	6, 1, 32	3, 6, 32		3, 6, 32
29	Manufacturing precision	3, 27, 40		19, 26	3, 32	32, 2		32, 2
30	Object-affected harmful factors	22, 15, 33, 28	17, 1, 40, 33	22, 33, 35, 2	1, 19, 32, 13	1, 24, 6, 27	10, 2, 22, 37	19, 22, 31, 2
31	Object-generated harmful factors	15, 22, 33, 31	21, 39, 16, 22	22, 35, 2, 24	19, 24, 39, 32	2, 35, 6	19, 22, 18	2, 35, 18
32	Ease of manufacture	27, 1, 4	35, 16	27, 26, 18	28, 24, 27, 1	28, 26, 27, 1	1, 4	27, 1, 12, 24
33	Ease of operation	29, 3, 8, 25	1, 16, 25	26, 27, 13	13, 17, 1, 24	1, 13, 24		35, 34, 2, 10
34	Ease of repair	11, 29, 28, 27	1	4, 10	15, 1, 13	15, 1, 28, 16		15, 10, 32, 2
35	Adaptability or versatility	13, 1, 35	2, 16	27, 2, 3, 35	6, 22, 26, 1	19, 35, 29, 13		19, 1, 29
36	Device complexity	10, 4, 28, 15		2, 17, 13	24, 17, 13	27, 2, 29, 28		20, 19, 30, 34
37	Difficulty of detecting and measuring	19, 29, 39, 25	25, 34, 6, 35	3, 27, 35, 16	2, 24, 26	35, 38	19, 35, 16	18, 1, 16, 10
38	Extent of automation	6, 9		26, 2, 19	8, 32, 19	2, 32, 13		28, 2, 27
39	Productivity	35, 10, 2, 18	20, 10, 16, 38	35, 21, 28, 10	26, 17, 19, 1	35, 10, 38, 19	1	35, 20, 10

Improving Feature \ Worsening Feature		Loss of Energy	Loss of Substance	Loss of Information	Loss of Time	Quantity of substance	Reliability	Measurement accuracy
		22	23	24	25	26	27	28
1	Weight of moving object	6, 2, 34, 19	5, 35, 3, 31	10, 24, 35	10, 35, 20, 28	3, 26, 18, 31	1, 3, 11, 27	28, 27, 35, 26
2	Weight of stationary object	18, 19, 28, 15	5, 8, 13, 30	10, 15, 35	10, 20, 35, 26	19, 6, 18, 26	10, 28, 8, 3	18, 26, 28
3	Length of moving object	7, 2, 35, 39	4, 29, 23, 10	1, 24	15, 2, 29	29, 35	10, 14, 29, 40	28, 32, 4
4	Length of stationary object	6, 28	10, 28, 24, 35	24, 26,	30, 29, 14		15, 29, 28	32, 28, 3
5	Area of moving object	15, 17, 30, 26	10, 35, 2, 39	30, 26	26, 4	29, 30, 6, 13	29, 9	26, 28, 32, 3
6	Area of stationary object	17, 7, 30	10, 14, 18, 39	30, 16	10, 35, 4, 18	2, 18, 40, 4	32, 35, 40, 4	26, 28, 32, 3
7	Volume of moving object	7, 15, 13, 16	36, 39, 34, 10	2, 22	2, 6, 34, 10	29, 30, 7	14, 1, 40, 11	25, 26, 28
8	Volume of stationary object		10, 39, 35, 34		35, 16, 32 18	35, 3	2, 35, 16	
9	Speed	14, 20, 19, 35	10, 13, 28, 38	13, 26		10, 19, 29, 38	11, 35, 27, 28	28, 32, 1, 24
10	Force (Intensity)	14, 15	8, 35, 40, 5		10, 37, 36	14, 29, 18, 36	3, 35, 13, 21	35, 10, 23, 24
11	Stress or pressure	2, 36, 25	10, 36, 3, 37		37, 36, 4	10, 14, 36	10, 13, 19, 35	6, 28, 25
12	Shape	14	35, 29, 3, 5		14, 10, 34, 17	36, 22	10, 40, 16	28, 32, 1
13	Stability of the object's composition	14, 2, 39, 6	2, 14, 30, 40		35, 27	15, 32, 35		13
14	Strength	35	35, 28, 31, 40		29, 3, 28, 10	29, 10, 27	11, 3	3, 27, 16
15	Duration of action of moving object		28, 27, 3, 18	10	20, 10, 28, 18	3, 35, 10, 40	11, 2, 13	3
16	Duration of action by stationary object		27, 16, 18, 38	10	28, 20, 10, 16	3, 35, 31	34, 27, 6, 40	10, 26, 24
17	Temperature	21, 17, 35, 38	21, 36, 29, 31		35, 28, 21, 18	3, 17, 30, 39	19, 35, 3, 10	32, 19, 24
18	Illumination intensity	13, 16, 1, 6	13, 1	1, 6	19, 1, 26, 17	1, 19		11, 15, 32
19	Use of energy by moving object	12, 22, 15, 24	35, 24, 18, 5		35, 38, 19, 18	34, 23, 16, 18	19, 21, 11, 27	3, 1, 32
20	Use of energy by stationary object		28, 27, 18, 31			3, 35, 31	10, 36, 23	
21	Power	10, 35, 38	28, 27, 18, 38	10, 19	35, 20, 10, 6	4, 34, 19	19, 24, 26, 31	32, 15, 2
22	Loss of Energy	+	35, 27, 2, 37	19, 10	10, 18, 32, 7	7, 18, 25	11, 10, 35	32
23	Loss of substance	35, 27, 2, 31	+		15, 18, 35, 10	6, 3, 10, 24	10, 29, 39, 35	16, 34, 31, 28
24	Loss of Information	19, 10		+	24, 26, 28, 32	24, 28, 35	10, 28, 23	

Worsening Feature / Improving Feature		Loss of Energy	Loss of Substance	Loss of Information	Loss of Time	Quantity of substance	Reliability	Measurement accuracy
		22	23	24	25	26	27	28
25	Loss of Time	10, 5, 18, 32	35, 18, 10, 39	24, 26, 28, 32	+	35, 38, 18, 16	10, 30, 4	24, 34, 28, 32
26	Quantity of substance/the matter	7, 18, 25	6, 3, 10, 24	24, 28, 35	35, 38, 18, 16	+	18, 3, 28, 40	13, 2, 28
27	Reliability	10, 11, 35	10, 35, 29, 39	10, 28	10, 30, 4	21, 28, 40, 3	+	32, 3, 11, 23
28	Measurement accuracy	26, 32, 27	10, 16, 31, 28		24, 34, 28, 32	2, 6, 32	5, 11, 1, 23	+
29	Manufacturing precision	13, 32, 2	35, 31, 10, 24		32, 26, 28, 18	32, 30	11, 32, 1	
30	Object-affected harmful factors	21, 22, 35, 2	33, 22, 19, 40	22, 10, 2	35, 18, 34	35, 33, 29, 31	27, 24, 2, 40	28, 33, 23, 26
31	Object-generated harmful factors	21, 35, 2, 22	10, 1, 34	10, 21, 29	1, 22	3, 24, 39, 1	24, 2, 40, 39	3, 33, 26
32	Ease of manufacture	19, 35	15, 34, 33	32, 24, 18, 16	35, 28, 34, 4	35, 23, 1, 24		1, 35, 12, 18
33	Ease of operation	2, 19, 13	28, 32, 2, 24	4, 10, 27, 22	4, 28, 10, 34	12, 35	17, 27, 8, 40	25, 13, 2, 34
34	Ease of repair	15, 1, 32, 19	2, 35, 34, 27		32, 1, 10, 25	2, 28, 10, 25	11, 10, 1, 16	10, 2, 13
35	Adaptability or versatility	18, 15, 1	15, 10, 2, 13		35, 28	3, 35, 15	35, 13, 8, 24	35, 5, 1, 10
36	Device complexity	10, 35, 13, 2	35, 10, 28, 29		6, 29	13, 3, 27, 10	13, 35, 1	2, 26, 10, 34
37	Difficulty of detecting and measuring	35, 3, 15, 19	1, 18, 10, 24	35, 33, 27, 22	18, 28, 32, 9	3, 27, 29, 18	27, 40, 28, 8	26, 24, 32, 28
38	Extent of automation	23, 28	35, 10, 18, 5	35, 33	24, 28, 35, 30	35, 13	11, 27, 32	28, 26, 10, 34
39	Productivity	28, 10, 29, 35	28, 10, 35, 23	13, 15, 23		35, 38	1, 35, 10, 38	1, 10, 34, 28

Improving Feature \ Worsening Feature		Manufacturing precision	Object-affected harmful factors	Object-generated harmful factors	Ease of manufacture	Ease of operation	Ease of repair	Adaptability or versatility
		29	30	31	32	33	34	35
1	Weight of moving object	28, 35, 26, 18	22, 21, 18, 27	22, 35, 31, 39	27, 28, 1, 36	35, 3, 2, 24	2, 27, 28, 11	29, 5, 15, 8
2	Weight of stationary object	10, 1, 35, 17	2, 19, 22, 37	35, 22, 1, 39	28, 1, 9	6, 13, 1, 32	2, 27, 28, 11	19, 15, 29
3	Length of moving object	10, 28, 29, 37	1, 15, 17, 24	17, 15	1, 29, 17	15, 29, 35, 4	1, 28, 10	14, 15, 1, 16
4	Length of stationary object	2, 32, 10	1, 18		15, 17, 27	2, 25	3	1, 35
5	Area of moving object	2, 32	22, 33, 28, 1	17, 2, 18, 39	13, 1, 26, 24	15, 17, 13, 16	15, 13, 10, 1	15, 30
6	Area of stationary object	2, 29, 18, 36	27, 2, 39, 35	22, 1, 40	40, 16	16, 4	16	15, 16
7	Volume of moving object	25, 28, 2, 16	22, 21, 27, 35	17, 2, 40, 1	29, 1, 40	15, 13, 30, 12	10	15, 29
8	Volume of stationary object	35, 10, 25	34, 39, 19, 27	30, 18, 35, 4	35		1	
9	Speed	10, 28, 32, 25	1, 28, 35, 23	2, 24, 35, 21	35, 13, 8, 1	32, 28, 13, 12	34, 2, 28, 27	15, 10, 26
10	Force (Intensity)	28, 29, 37, 36	1, 35, 40, 18	13, 3, 36, 24	15, 37, 18, 1	1, 28, 3, 25	15, 1, 11	15, 17, 18, 20
11	Stress or pressure	3, 35	22, 2, 37	2, 33, 27, 18	1, 35, 16	11	2	35
12	Shape	32, 30, 40	22, 1, 2, 35	35, 1	1, 32, 17, 28	32, 15, 26	2, 13, 1	1, 15, 29
13	Stability of the object's composition	18	35, 24, 30, 18	35, 40, 27, 39	35, 19	32, 35, 30	2, 35, 10, 16	35, 30, 34, 2
14	Strength	3, 27	18, 35, 37, 1	15, 35, 22, 2	11, 3, 10, 32	32, 40, 25, 2	27, 11, 3	15, 3, 32
15	Duration of action of moving object	3, 27, 16, 40	22, 15, 33, 28	21, 39, 16, 22	27, 1, 4	12, 27	29, 10, 27	1, 35, 13
16	Duration of action by stationary object		17, 1, 40, 33	22	35, 10	1	1	2
17	Temperature	24	22, 33, 35, 2	22, 35, 2, 24	26, 27	26, 27	4, 10, 16	2, 18, 27
18	Illumination intensity	3, 32	15, 19	35, 19, 32, 39	19, 35, 28, 26	28, 26, 19	15, 17, 13, 16	15, 1, 19
19	Use of energy by moving object		1, 35, 6, 27	2, 35, 6	28, 26, 30	19, 35	1, 15, 17, 28	15, 17, 13, 16
20	Use of energy by stationary object		10, 2, 22, 37	19, 22, 18	1, 4			
21	Power	32, 2	19, 22, 31, 2	2, 35, 18	26, 10, 34	26, 35, 10	35, 2, 10, 34	19, 17, 34
22	Loss of Energy		21, 22, 35, 2	21, 35, 2, 22		35, 32, 1	2, 19	
23	Loss of substance	35, 10, 24, 31	33, 22, 30, 40	10, 1, 34, 29	15, 34, 33	32, 28, 2, 24	2, 35, 34, 27	15, 10, 2
24	Loss of Information		22, 10, 1	10, 21, 22	32	27, 22		

Improving Feature \ Worsening Feature		Manufacturing precision	Object-affected harmful factors	Object-generated harmful factors	Ease of manufacture	Ease of operation	Ease of repair	Adaptability or versatility
		29	30	31	32	33	34	35
25	Loss of Time	24, 26, 28, 18	35, 18, 34	35, 22, 18, 39	35, 28, 34, 4	4, 28, 10, 34	32, 1, 10	35, 28
26	Quantity of substance/the matter	33, 30	35, 33, 29, 31	3, 35, 40, 39	29, 1, 35, 27	35, 29, 25, 10	2, 32, 10, 25	15, 3, 29
27	Reliability	11, 32, 1	27, 35, 2, 40	35, 2, 40, 26		27, 17, 40	1, 11	13, 35, 8, 24
28	Measurement accuracy		28, 24, 22, 26	3, 33, 39, 10	6, 35, 25, 18	1, 13, 17, 34	1, 32, 13, 11	13, 35, 2
29	Manufacturing precision	+	26, 28, 10, 36	4, 17, 34, 26		1, 32, 35, 23	25, 10	
30	Object-affected harmful factors	26, 28, 10, 18	+		24, 35, 2	2, 25, 28, 39	35, 10, 2	35, 11, 22, 31
31	Object-generated harmful factors	4, 17, 34, 26		+				
32	Ease of manufacture		24, 2		+	2, 5, 13, 16	35, 1, 11, 9	2, 13, 15
33	Ease of operation	1, 32, 35, 23	2, 25, 28, 39		2, 5, 12	+	12, 26, 1, 32	15, 34, 1, 16
34	Ease of repair	25, 10	35, 10, 2, 16		1, 35, 11, 10	1, 12, 26, 15	+	7, 1, 4, 16
35	Adaptability or versatility		35, 11, 32, 31		1, 13, 31	15, 34, 1, 16	1, 16, 7, 4	+
36	Device complexity	26, 24, 32	22, 19, 29, 40	19, 1	27, 26, 1, 13	27, 9, 26, 24	1, 13	29, 15, 28, 37
37	Difficulty of detecting and measuring		22, 19, 29, 28	2, 21	5, 28, 11, 29	2, 5	12, 26	1, 15
38	Extent of automation	28, 26, 18, 23	2, 33	2	1, 26, 13	1, 12, 34, 3	1, 35, 13	27, 4, 1, 35
39	Productivity	18, 10, 32, 1	22, 35, 13, 24	35, 22, 18, 39	35, 28, 2, 24	1, 28, 7, 10	1, 32, 10, 25	1, 35, 28, 37

Improving Feature \ Worsening Feature		Device complexity	Difficulty of detecting and measuring	Extent of automation	Productivity
		36	37	38	39
1	Weight of moving object	26, 30, 36, 34	28, 29, 26, 32	26, 35 18, 19	35, 3, 24, 37
2	Weight of stationary object	1, 10, 26, 39	25, 28, 17, 15	2, 26, 35	1, 28, 15, 35
3	Length of moving object	1, 19, 26, 24	35, 1, 26, 24	17, 24, 26, 16	14, 4, 28, 29
4	Length of stationary object	1, 26	26		30, 14, 7, 26
5	Area of moving object	14, 1, 13	2, 36, 26, 18	14, 30, 28, 23	10, 26, 34, 2
6	Area of stationary object	1, 18, 36	2, 35, 30, 18	23	10, 15, 17, 7
7	Volume of moving object	26, 1	29, 26, 4	35, 34, 16, 24	10, 6, 2, 34
8	Volume of stationary object	1, 31	2, 17, 26		35, 37, 10, 2
9	Speed	10, 28, 4, 34	3, 34, 27, 16	10, 18	
10	Force (Intensity)	26, 35, 10, 18	36, 37, 10, 19	2, 35	3, 28, 35, 37
11	Stress or pressure	19, 1, 35	2, 36, 37	35, 24	10, 14, 35, 37
12	Shape	16, 29, 1, 28	15, 13, 39	15, 1, 32	17, 26, 34, 10
13	Stability of the object's composition	2, 35, 22, 26	35, 22, 39, 23	1, 8, 35	23, 35, 40, 3
14	Strength	2, 13, 25, 28	27, 3, 15, 40	15	29, 35, 10, 14
15	Duration of action of moving object	10, 4, 29, 15	19, 29, 39, 35	6, 10	35, 17, 14, 19
16	Duration of action by stationary object		25, 34, 6, 35	1	20, 10, 16, 38
17	Temperature	2, 17, 16	3, 27, 35, 31	26, 2, 19, 16	15, 28, 35
18	Illumination intensity	6, 32, 13	32, 15	2, 26, 10	2, 25, 16
19	Use of energy by moving object	2, 29, 27, 28	35, 38	32, 2	12, 28, 35
20	Use of energy by stationary object		19, 35, 16, 25		1, 6
21	Power	20, 19, 30, 34	19, 35, 16	28, 2, 17	28, 35, 34
22	Loss of Energy	7, 23	35, 3, 15, 23	2	28, 10, 29, 35
23	Loss of substance	35, 10, 28, 24	35, 18, 10, 13	35, 10, 18	28, 35, 10, 23
24	Loss of Information		35, 33	35	13, 23, 15

Improving Feature \ Worsening Feature		Device complexity	Difficulty of detecting and measuring	Extent of automation	Productivity
		36	37	38	39
25	Loss of Time	6, 29	18, 28, 32, 10	24, 28, 35, 30	
26	Quantity of substance/the matter	3, 13, 27, 10	3, 27, 29, 18	8, 35	13, 29, 3, 27
27	Reliability	13, 35, 1	27, 40, 28	11, 13, 27	1, 35, 29, 38
28	Measurement accuracy	27, 35, 10, 34	26, 24, 32, 28	28, 2, 10, 34	10, 34, 28, 32
29	Manufacturing precision	26, 2, 18		26, 28, 18, 23	10, 18, 32, 39
30	Object-affected harmful factors	22, 19, 29, 40	22, 19, 29, 40	33, 3, 34	22, 35, 13, 24
31	Object-generated harmful factors	19, 1, 31	2, 21, 27, 1	2	22, 35, 18, 39
32	Ease of manufacture	27, 26, 1	6, 28, 11, 1	8, 28, 1	35, 1, 10, 28
33	Ease of operation	32, 26, 12, 17		1, 34, 12, 3	15, 1, 28
34	Ease of repair	35, 1, 13, 11		34, 35, 7, 13	1, 32, 10
35	Adaptability or versatility	15, 29, 37, 28	1	27, 34, 35	35, 28, 6, 37
36	Device complexity	+	15, 10, 37, 28	15, 1, 24	12, 17, 28
37	Difficulty of detecting and measuring	15, 10, 37, 28	+	34, 21	35, 18
38	Extent of automation	15, 24, 10	34, 27, 25	+	5, 12, 35, 26
39	Productivity	12, 17, 28, 24	35, 18, 27, 2	5, 12, 35, 26	+

4 Klasifikasi

Sprayer gendong semi-otomatis dapat diklasifikasikan berdasarkan jenis bahan pembuatan tangki sprayer, yaitu: baja tahan karat (*stainless steel*), dan plastik (*polyethylene* densitas tinggi atau *high density polyethylene* / HDPE).

4.1 Tangki sprayer dari bahan baja tahan karat

Sprayer gendong semi-otomatis dengan tangki sprayer terbuat dari bahan baja tahan karat dapat dilihat dalam Gambar 1.

4.2 Tangki sprayer dari bahan plastik

Sprayer gendong semi-otomatis dengan tangki sprayer terbuat dari bahan plastik HDPE dapat dilihat dalam Gambar 2.

5 Syarat mutu

5.1 Umum (ISO 19932-2:2006 (E))

Sprayer harus nyaman dipakai dan tidak melelahkan operator.
Massa sprayer dengan tangki terisi hingga volume nominalnya tidak boleh lebih dari 25 kg, dan satu orang operator harus dapat mengangkatnya, membawanya, dan meletakkannya.
Keluaran cairan semprot harus dapat disetel dengan cara mengubah frekuensi pemompaan.
Tidak boleh ada bagian permukaan atau sisi komponen sprayer yang tajam.
Komponen-komponen sprayer, seperti: nosel, saringan, katup-katup, dan torak atau diafragma, harus dapat diganti dengan mudah.
Sprayer tidak boleh gagal ketika dilakukan uji kestabilan.
Ketika dilakukan uji volume cairan sisa total, sprayer dengan kapasitas tangki ≤17 liter maka volume cairan sisa tidak boleh lebih dari 250 ml, sedangkan sprayer dengan kapasitas tangki lebih dari 17 liter maka volume cairan sisa tidak boleh lebih dari 1.5% dari volume nominal.
Sprayer harus mempunyai laju tekanan semprot secara terus menerus dan teratur ± 15% dari nilai tekanan maksimum .
Jumlah cairan tersisa dalam tangki maksimum 50 ml ketika dilakukan uji pengosongan.
Sprayer tidak rusak (masih dapat berfungsi secara normal) apabila dilakukan uji bentur

5.2 Spesifikasi teknis

Spesifikasi teknis sprayer gendong semi-otomatis dengan tangki sprayer terbuat dari bahan baja tahan karat dan bahan plastik HDPE dapat dilihat pada Tabel 1.

Tabel 1 - Spesifikasi teknik sprayer gendong semi-otomatis

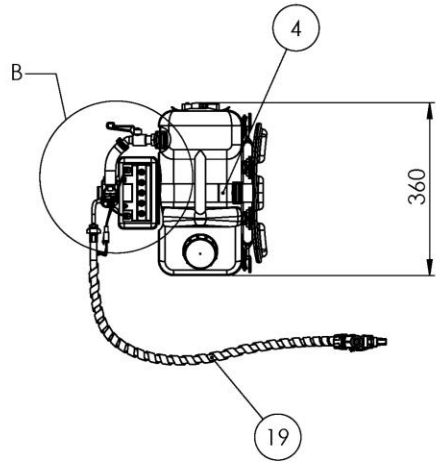
No.	Parameter	Satuan	Tangki baja tahan karat	Tangki plastik HDPE
1.	Bobot kosong sprayer	kg	3,5 – 7 (SNI 07-0413:1989)	4 – 6
2.	Kapasitas tangki	liter	6 – 18	12 – 18
3.	Lebar tangki	mm	130 – 170	180 – 220
4.	Panjang tangki	mm	330 – 370	320 – 360
5.	Tinggi tangki	mm	415 – 455	500 – 540
6.	Panjang selang	mm	1200 – 1300	1000 – 1300
7.	Panjang pipa	mm	500 – 600	500 – 600
8.	Tekanan kerja	kPa (kg/cm^2)	200 – 600 (2 – 6)	200 – 400 (2 – 4)
9.	Tebal dinding tangki	mm	0,4 – 1	≥ 2

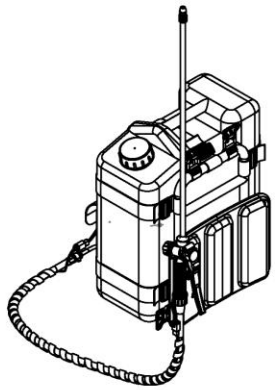
5.3 Komponen sprayer

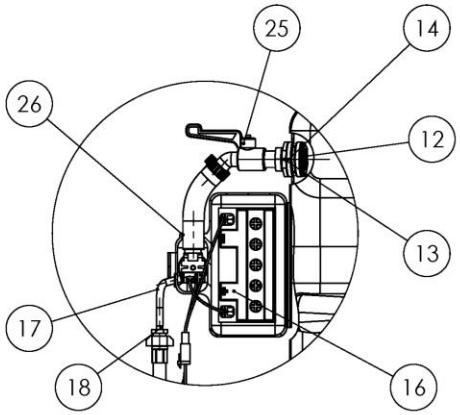
Syarat mutu komponen-komponen sprayer gendong semi-otomatis disajikan pada Tabel 2.

Tabel 2 - Syarat mutu komponen-komponen sprayer

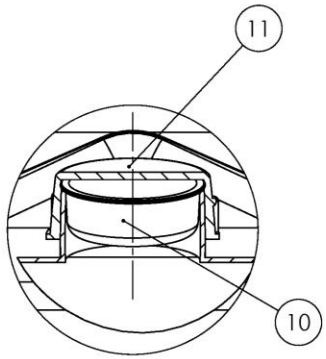
No.	Komponen sprayer	Syarat mutu
1.	Tangki	terbuat dari baja tahan karat (stainless steel) dan plastik HDPE) Batas dan permukaan pengisian cairan harus mudah terlihat selama proses pengisian. Diameter lubang pengisian minimum 80 mm. Dapat dilengkapi dengan corong pengisian berdiameter bagian atas minimum 100 mm. Corong pengisian mempunyai saringan dengan ukuran lubang (0.5 – 2) mm. Volume total yang tumpah selama pengisian cairan maksimum 5 ml. Tutup tangki (*lid*) harus mudah ditutup oleh operator yang memakai sarung tangan dan berfungsi sebagai penyekat (*seal*) yang effektif. Mempunyai volume cadangan minimum 5% dari volume nominal. Kesalahan pengukuran maksimum pada skala isi volumetrik adalah ± 7.5%, hingga ke permukaan pengisian sebesar 20% dari volume nominal, dan ± 5% untuk tinggi permukaan pengisian lebih besar. Volume deposit di permukaan luar sprayer maksimum 70 ml.



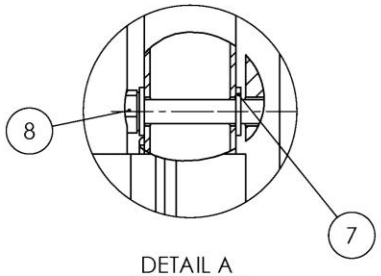




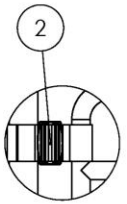
DETAIL B
SCALE 1 : 5



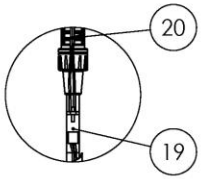
DETAIL C
SCALE 1 : 2



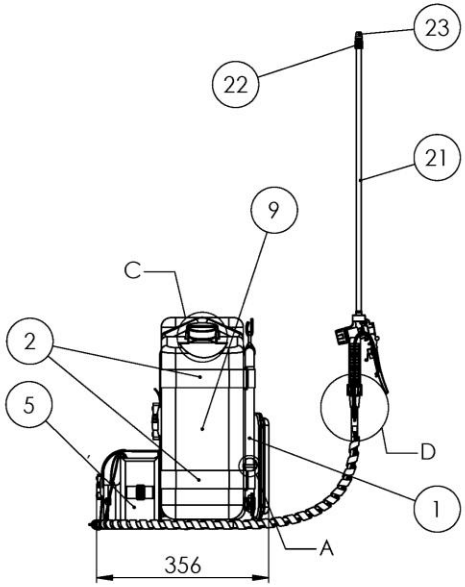
DETAIL A
SCALE 1 : 1

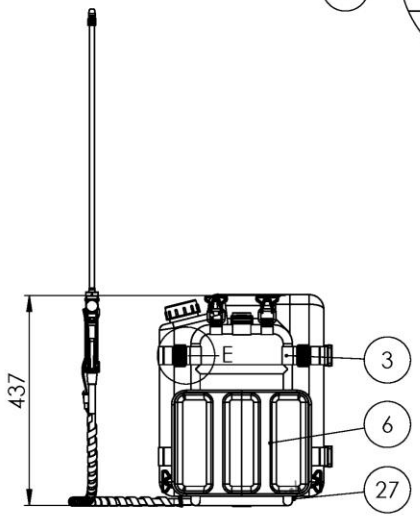


DETAIL E
SCALE 1 : 5



DETAIL D
SCALE 1 : 5

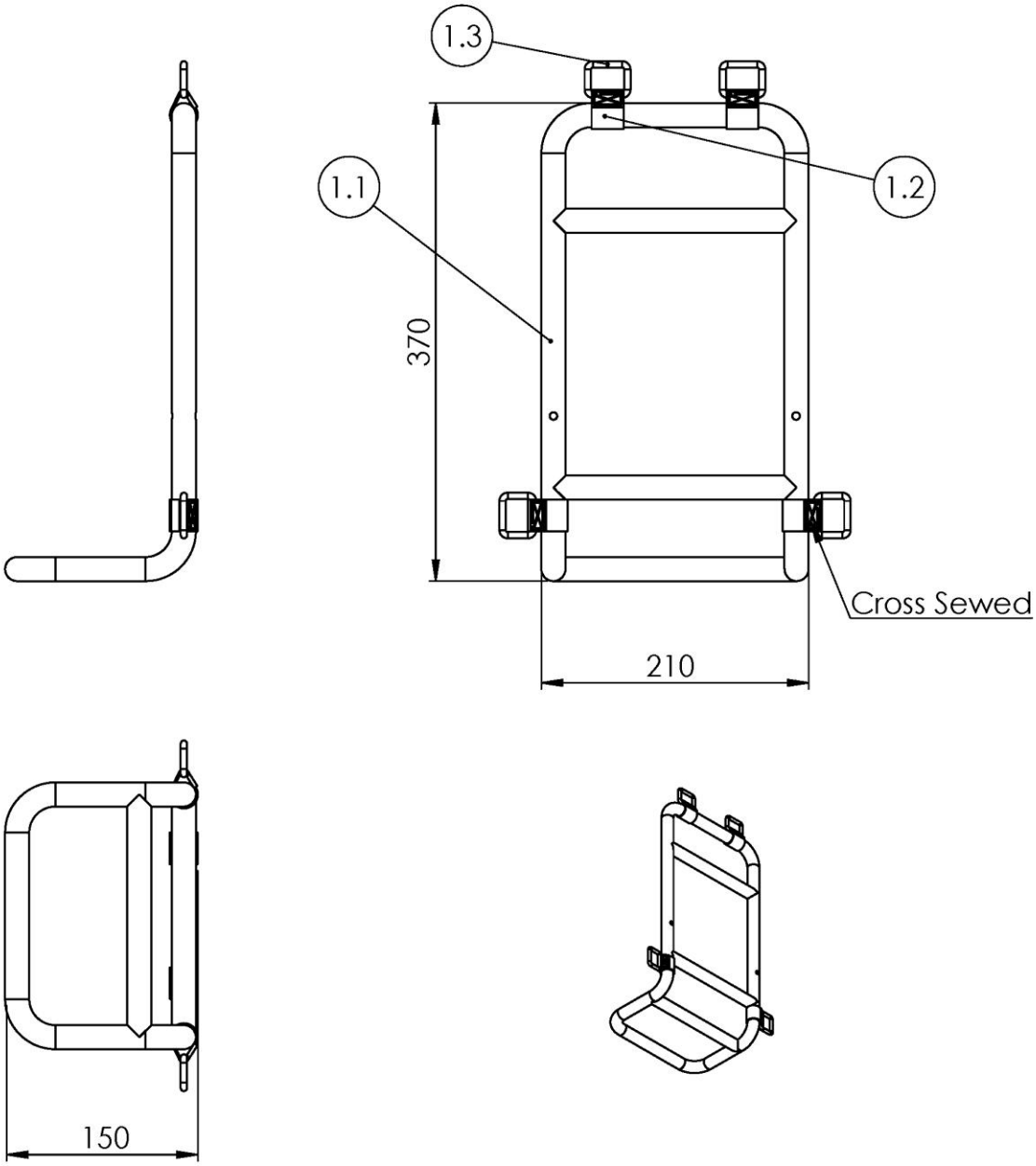




Pieces	Description	Item	Material	Dimension	Remarks
Revision Index	Drawn by : Gregorius Widyo			Scale :1:10	
	Reg. Nr. :			Unit :	
	Date :7/5/2013			Material :Cast Iron	
	Checked by :			Sign. :	
	A3	Electric Sprayer			
INDUSTRIAL ENGINEERING UAJY		Operation		Dwg. Nr. 6741	
Origin.	Rep.	Rep.by.		SN. NS.	

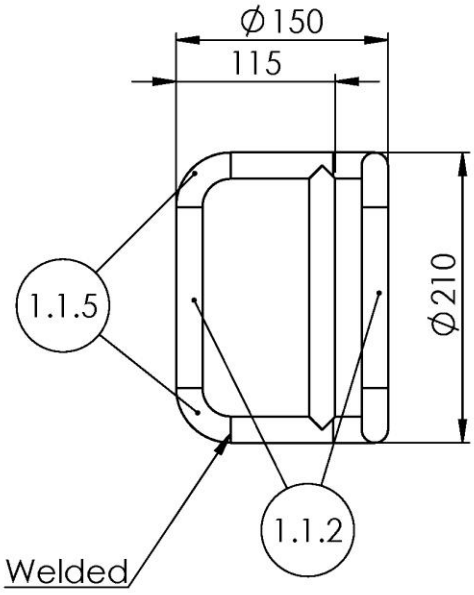
Pieces	Description	Item	Material	Dimension	Remarks
1	Hose Clamp	27		Ø 1 "	Purchased
1	Drain Hose	26			Purchased
1	Shut Off Valve	25		Ø1/2 "	Purchased
1	Shoulder Straps	24			Purchased
1	Single Nozzle	23			Purchased
1	4 hole nozzle	22			Purchased
1	Sprayer Rod	21			Purchased
1	Sprayer Handdle Assy	20			6741-11
1	Sprayer Hose Assy	19			6741-10
1	Hose Connector	18			Purchased
1	Outlet Pump Hose	17			Purchased
1	Accu Assy	16			6741-9
1	Washer Pump	15		Universal Type	Purchased
2	Rubber ring	14		Ø 1 "	Purchased
1	Drain Cooler Nut	13		Ø 1 "	Purchased
1	Drain Cooler Bolt	12		Ø 1 "	Purchased
1	Tank Screw Cover	11			6741-8
1	Tank Plug Cover	10			6741-7
1	Tank	9			6741-6
2	Bolt	8		M5 x 30 x 30-N	Purchased
4	Washer	7		ISO 7091 - 5	Purchased
1	Back pad	6		Std. lawmover part	Purchased
1	Bag Assy	5			6741-5
1	Vertical Fastener Strap	4			6741-4
2	Horizontal Fastener Strap S	3			6741-3
2	Horizontal Fastener Strap L	2			6741-2
1	Pipe Frame Assy	1			6741-1

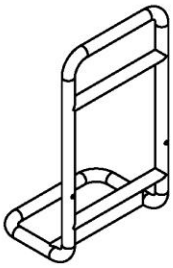
Revision Index	Drawn by : Gregorius Widyo	Scale :1:5	
	Reg. Nr. :	Unit :mm	
	Date : 7/5/2013	Material :	
	Checked by :	Sign. :	
	A4	Part List	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741
Origin.	Rep.	Rep.by.	SN. NS.

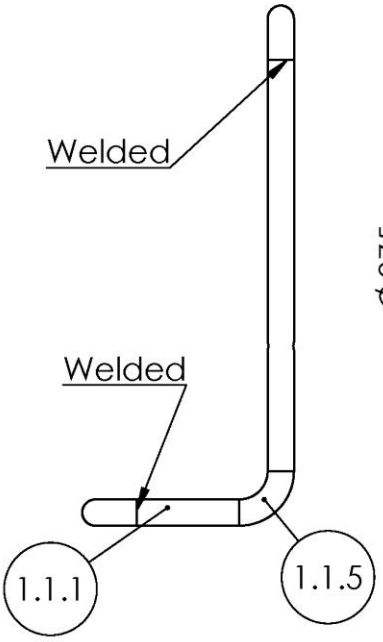


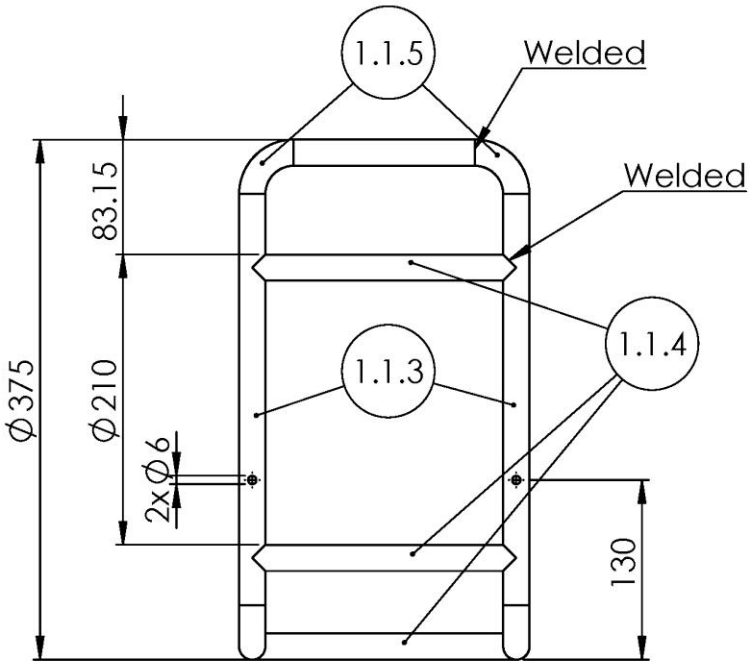
Pieces	Description	Item	Material	Dimension	Remarks
4	Square Ring	1.3	Brass Sq. Ring	For 25 mm width ban	Purchased
4	Strap clamp	1.2	Webbing Ban	25 x 2 x 10 mm	Purchased
1	Pipe Frame	1.1			6741-1-1

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:5
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material :
	Checked by :	Sign. :
	A4	Pipe Frame Assy
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-1
Origin.	Rep.	Rep.by. / SN. NS.



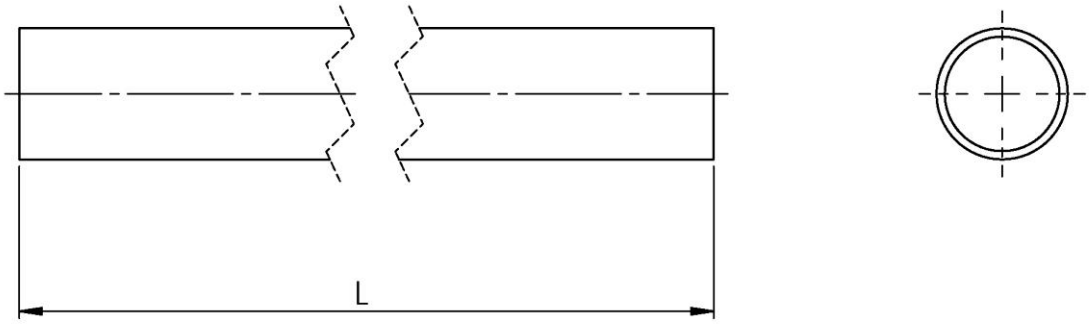






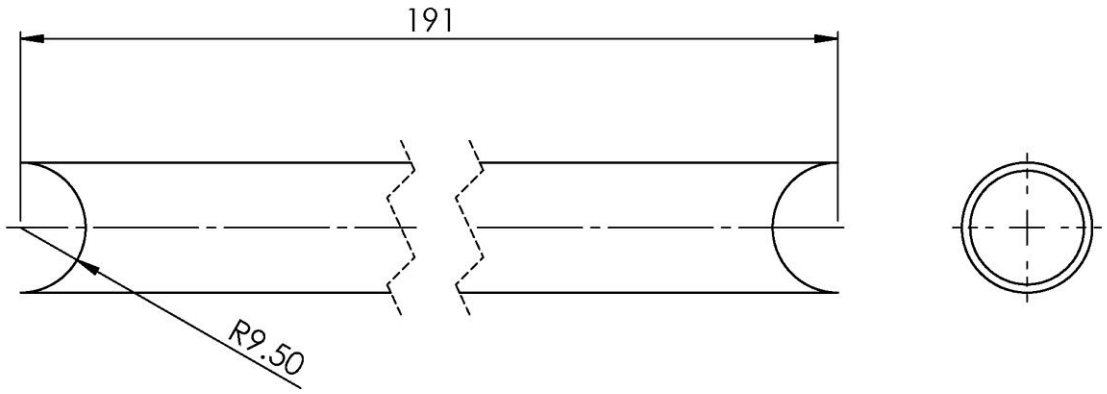
Pieces	Description	Item	Material	Dimension	Remarks
6	Elbow Black Pipe	1.1.5	Black Pipe	1/2 " x 1.2 mm	Purchased
3	Pipe Cut 4	1.1.4	Black Pipe	1/2 " x 1.2 mm	6741-1-1-2
2	Pipe Cut 3	1.1.3	Black Pipe	1/2 " x 1.2 mm	6741-1-1-1
2	Pipe Cut 2	1.1.2	Black Pipe	1/2 " x 1.2 mm	6741-1-1-1
2	Pipe Cut 1	1.1.1	Black Pipe	1/2 " x 1.2 mm	6741-1-1-1

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:5	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material :	
	Checked by :	Sign. :	
	A4	Pipe Frame	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-1-1
Origin.	Rep.	Rep.by.	SN. NS.

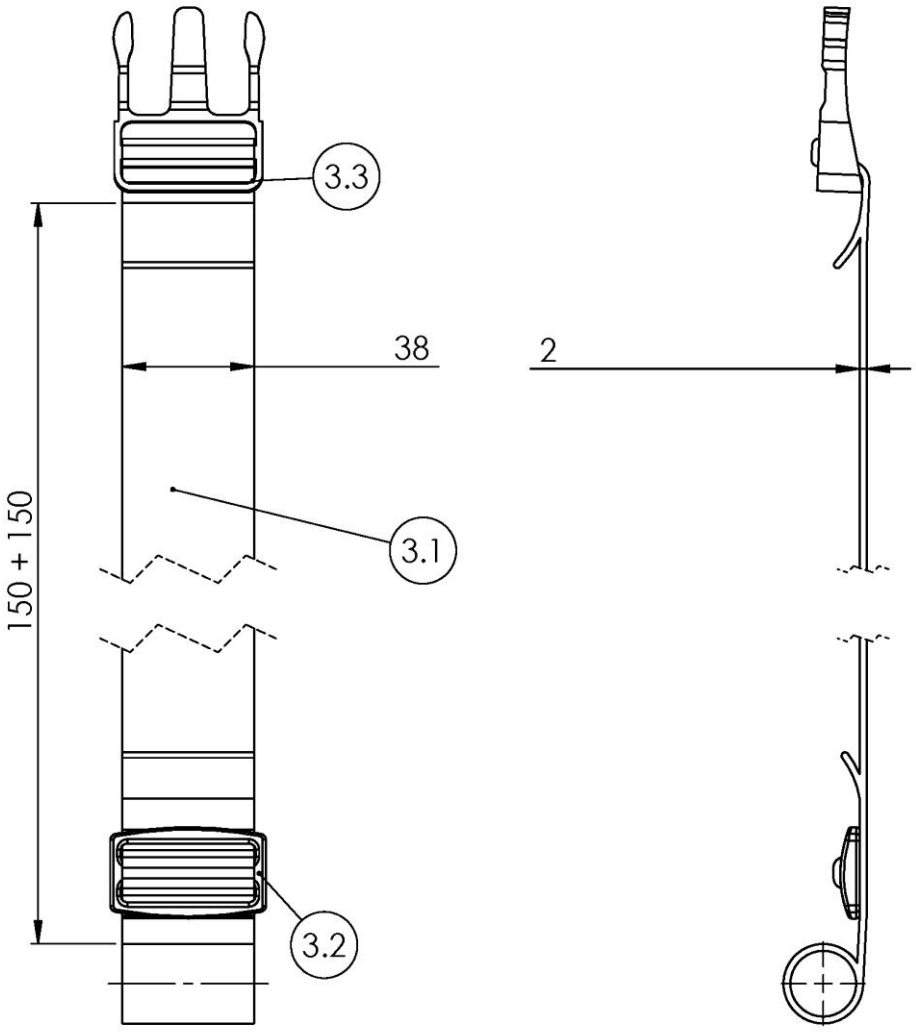


Item No.	Qty	L
1.1.1	2	74.15 mm
1.1.2	2	131 mm
1.1.3	2	297.3 mm

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:1
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material : Black pipe 1/2"x1.2 mm
	Checked by :	Sign. :
	A4	Pipe Cut 1-3
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-1-1
Origin.	Rep.	Rep.by. / SN. NS.

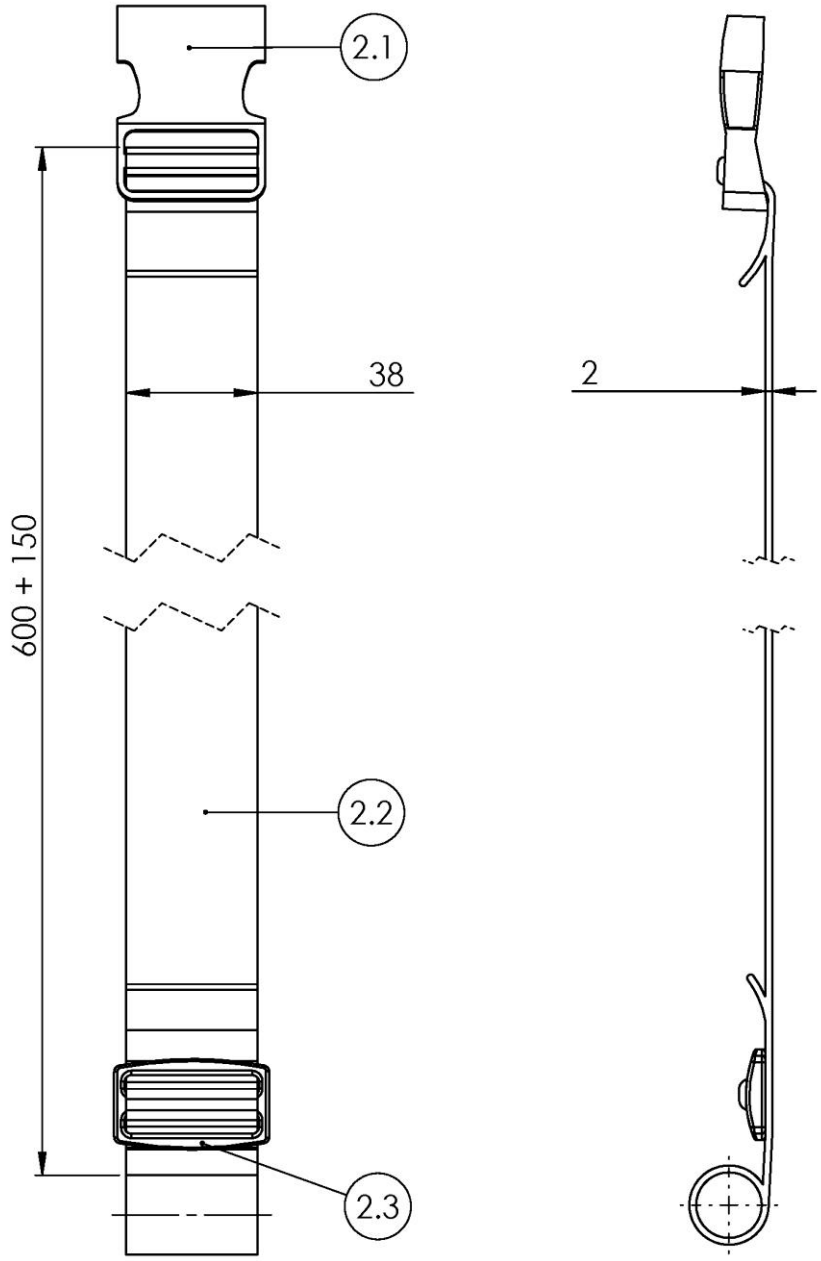


Revision Index	Drawn by : Gregorius Widyo	Scale : 1:1	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material : Black pipe 1/2"x1.2 mm	
	Checked by :	Sign. :	
	A4	Pipe Cut 4	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-1-2
Origin.	Rep.	Rep.by.	SN. NS.



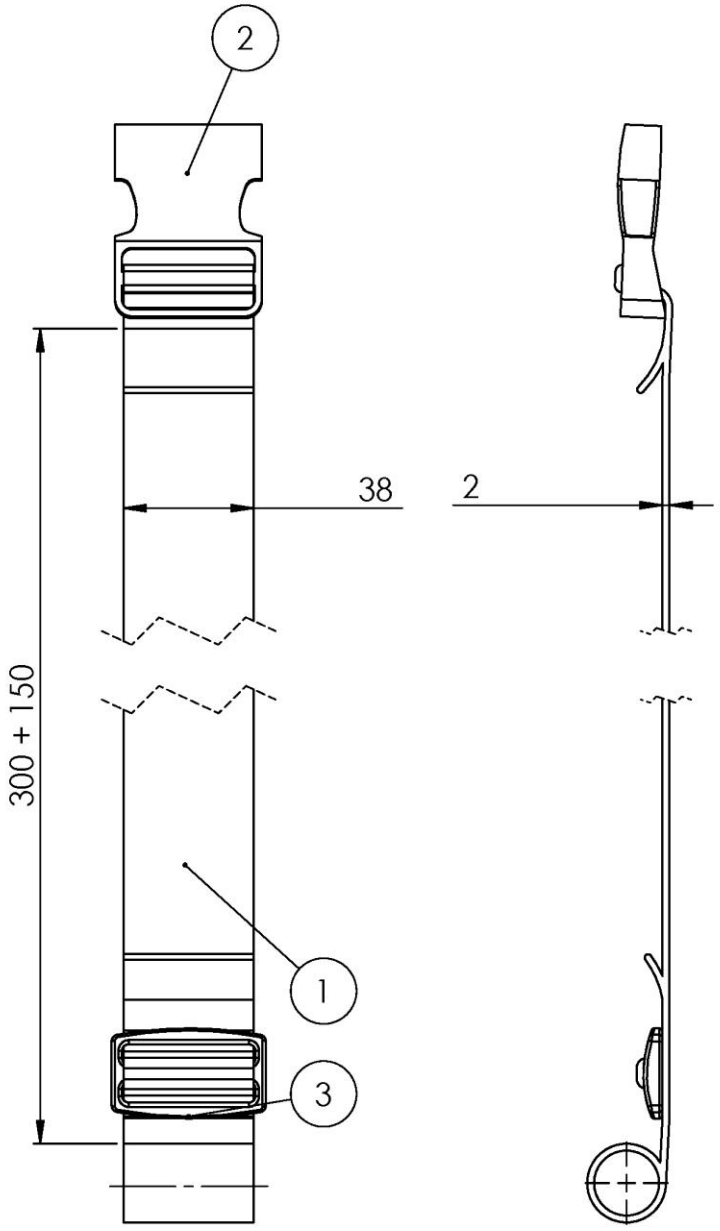
Pieces	Description	Item	Material	Dimension	Remarks
1	Male Buckle	3.3		38 mm width fit	Purchased
1	Strap Adjuster	3.2		38 mm width fit	Purchased
1	Webbing Band 38 mm width	3.1		L=300	Purchased

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material :
	Checked by :	Sign. :
	A4	Horizontal Fastener Strap S
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-3
Origin.	Rep.	Rep.by. / SN. NS.



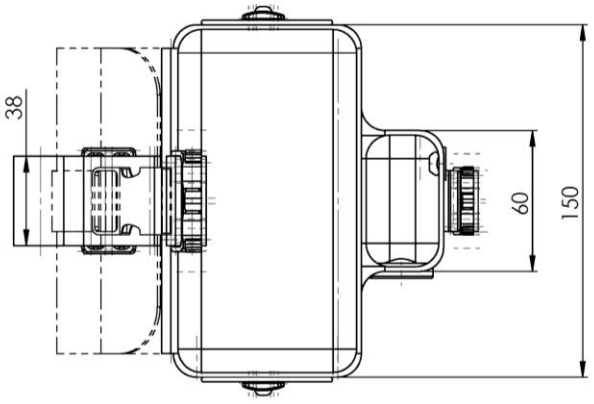
Pieces	Description	Item	Material	Dimension	Remarks
1	Strap Adjuster	2.3		38 mm width fit	Purchased
1	Webbing Band 38 mm width	2.2		L= 750 mm	Purchased
1	Female Buckle	2.1		38 mm width fit	Purchased

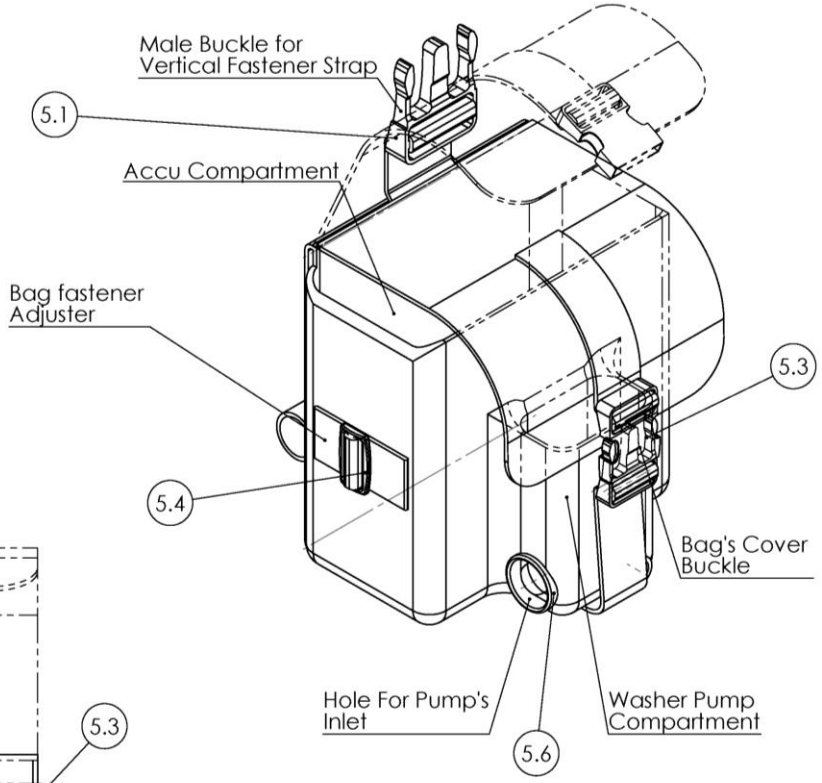
Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material :	
	Checked by :	Sign. :	
	A4	Horizontal Fastener Strap L	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-2
Origin.	Rep.	Rep.by.	SN. NS.

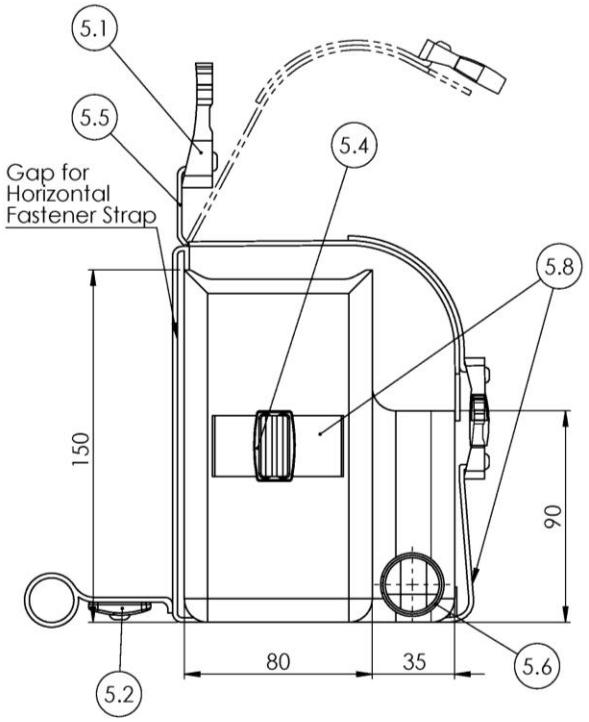


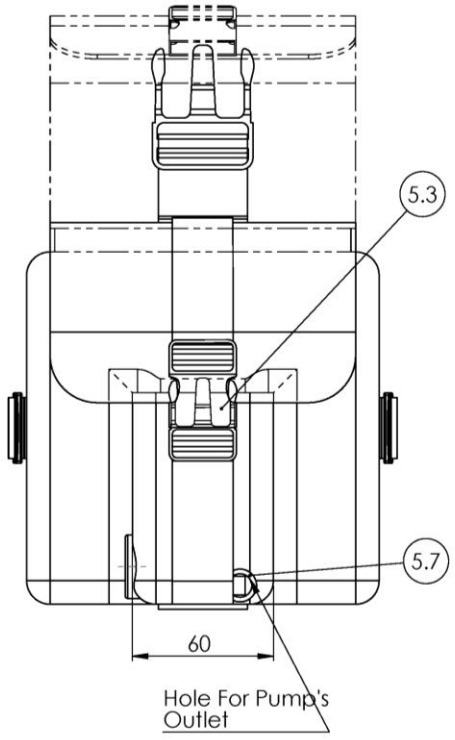
Pieces	Description	Item	Material	Dimension	Remarks
1	Strap Adjuster	3		38 mm width fit	Purchased
1	Female Buckle	2		38 mm width fit	Purchased
1	Webbing Band 38 mm width	1		L=450	Purchased

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material :
	Checked by :	Sign. :
	A4	Vertical Fastener Strap
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-4
Origin.	Rep.	Rep.by. / SN. NS.



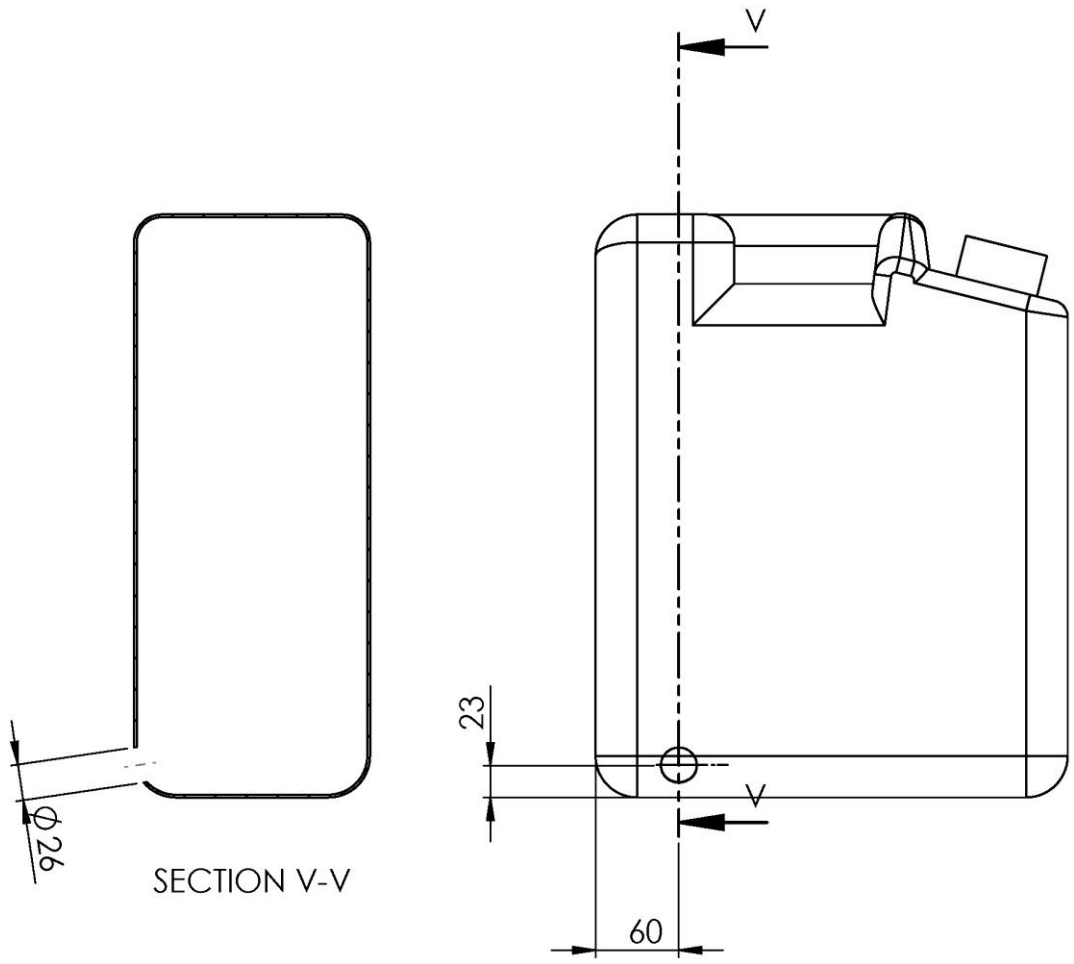




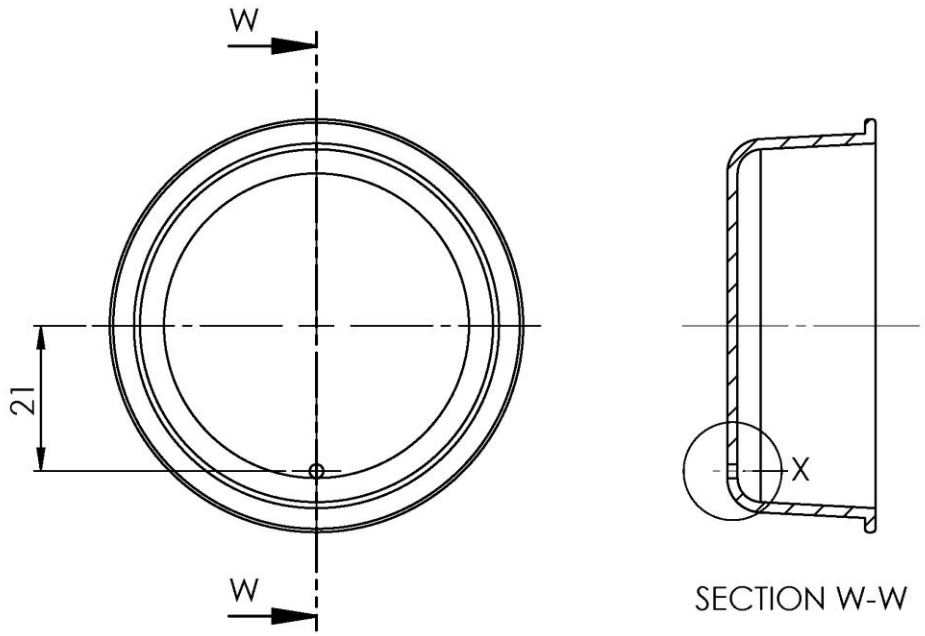


QTY.	Description	Item	Material	Dimension	Remarks
4	Webbing Band 25 mm	8		L=20mm	Purchased
1	Fabric Hole Clamp Ring 1/4"	7			Purchased
1	Fabric Hole Clamp Ring 1"	6			Purchased
1	Webbing Band 38 mm	5		L=40mm	Purchased
2	Strap adjuster 25 mm	4		25 mm width fit	Purchased
1	Buckle set (male-female) 25 mm	3		25 mm width fit	Purchased
1	Strap Adjuster 38 mm	5.2		38 mm width fit	Purchased
1	Male Buckle 38 mm	5.5		38 mm width fit	Purchased

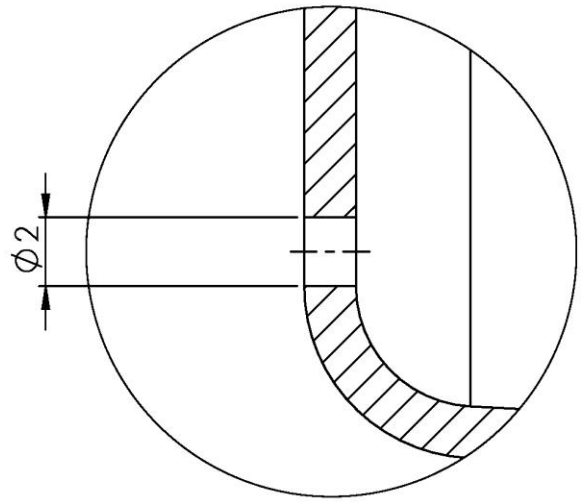
Revision Index	Drawn by : Gregorius Widyo	Scale	:1:2
	Reg. Nr. :	Unit	:mm
	Date :7/5/2013	Material	:Parasit Fabric
	Checked by :	Sign.	:
	A3	Bag Assy	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-5
Origin.	Rep.	Rep.by.	SN. NS.



Revision Index	Drawn by : Gregorius Widyo	Scale : 1:5	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material : Water tank 20 L	
	Checked by :	Sign. :	
	A4	Tank	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-6
Origin.	Rep.	Rep.by.	SN. NS.

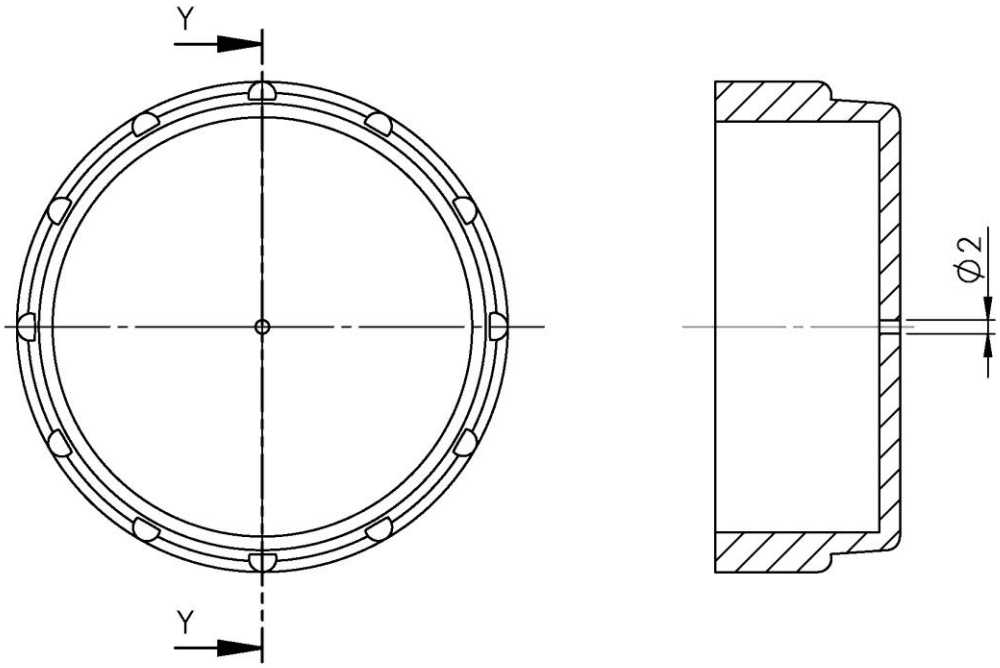


SECTION W-W



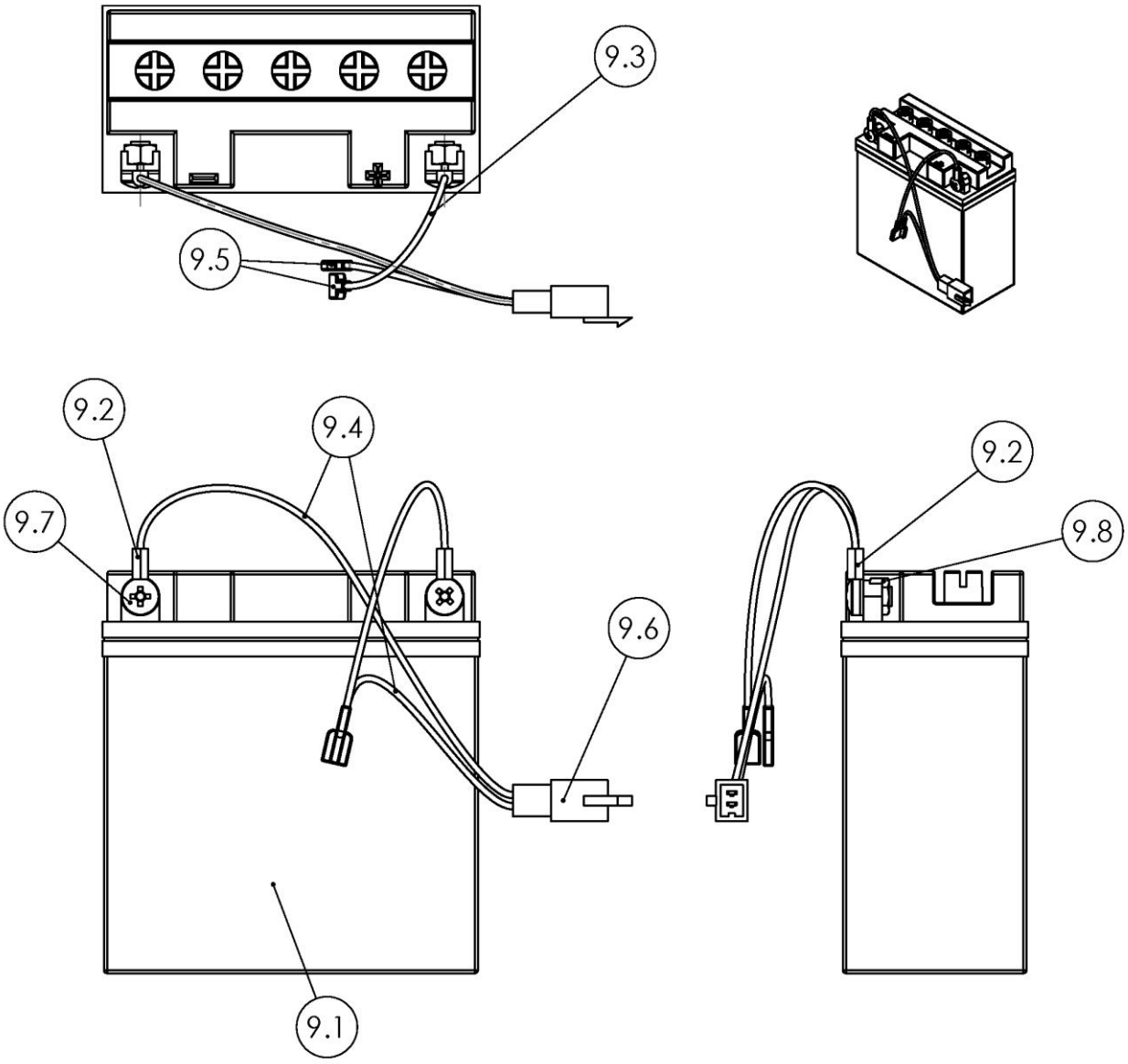
DETAIL X
SCALE 5 : 1

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:1
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material : Tank Plug Cover
	Checked by :	Sign. :
	A4	Tank Plug Cover
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-7
Origin.	Rep.	Rep.by. / SN. NS.



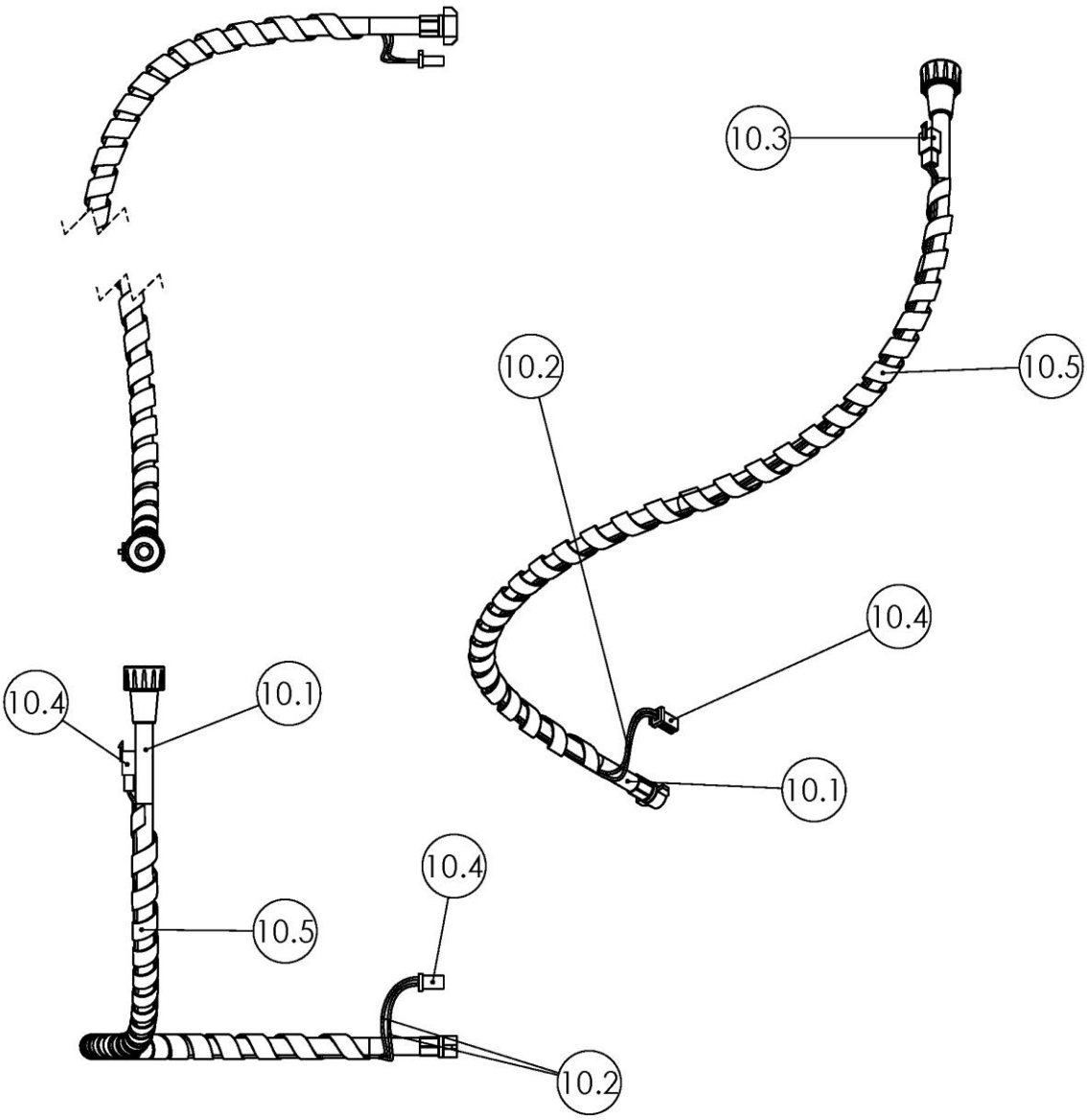
SECTION Y-Y

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:1	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material : Tank Screw Cover	
	Checked by :	Sign. :	
	A4	Tank Screw Cover	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741- 8
Origin.	Rep.	Rep.by.	SN. NS.



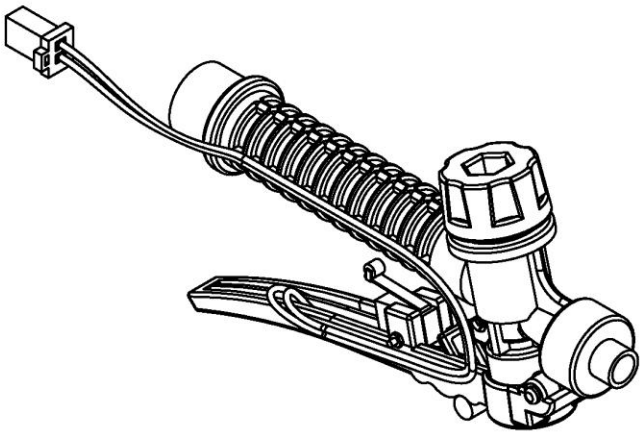
Pieces	Description	Item	Material	Dimension	Remarks
2	Hexagon Nut ISO - 4034 - M6 - N	9.8			Purchased
2	ISO 7045 - M6 x 10 - Z --- 10N	9.7			Purchased
1	2 pin Rcy Socket Female	9.6			Purchased
2	Washer Pump Cable Terminal	9.5			Purchased
2	Black Ø 2.5 mm cable	9.4		L=180mm	Purchased
1	Red Ø 2.5 mm cable	9.3		L=110mm	Purchased
2	Cable Lug for Motorcycle Accu	9.2			Purchased
1	Motorcycle Accumulator 10 AH	9.1			Purchased

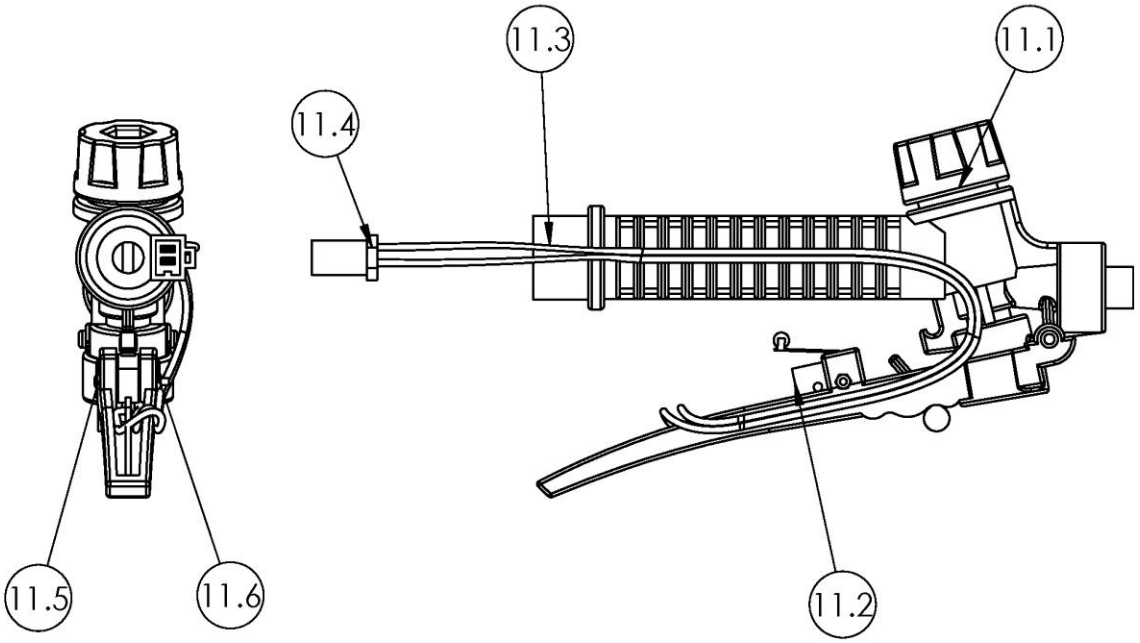
Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material :	
	Checked by :	Sign. :	
	A4	ACCU Assy	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-9
Origin.	Rep.	Rep.by.	SN. NS.



Pieces	Description	Item	Material	Dimension	Remarks
1	Sprayer Hose	10			
1	Cable Spiral	10.5		L=1000mm	Purchased
1	2 pin Rcy Socket male	10.4			Purchased
1	2 pin Rcy Socket Female	10.3			Purchased
2	Black ϕ 2.5 mm cable	10.2		L=1200mm	Purchased

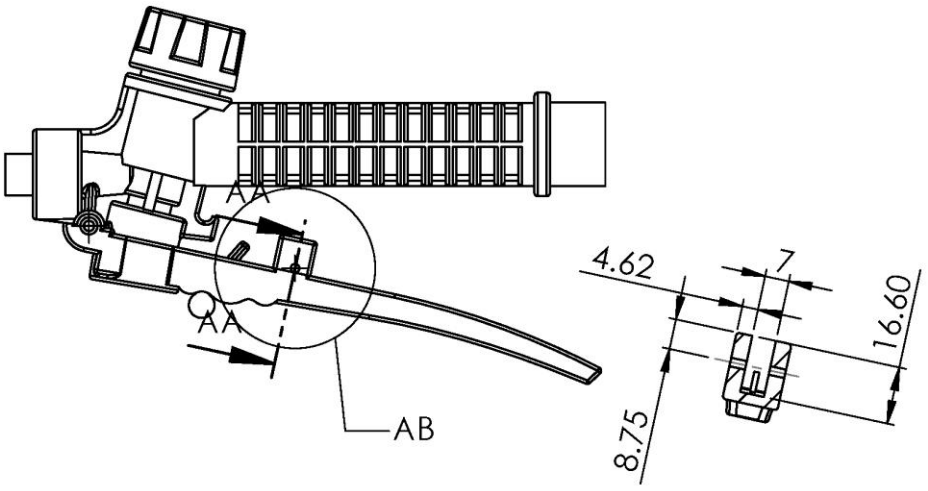
Revision Index	Drawn by : Gregorius Widyo	Scale : 1:5
	Reg. Nr. :	Unit : mm
	Date : 7/5/2013	Material :
	Checked by :	Sign. :
	A4	Sprayer Hose Assy
INDUSTRIAL ENGINEERING UAJY		Operation / Dwg. Nr. 6741-10
Origin.	Rep.	Rep.by. / SN. NS.



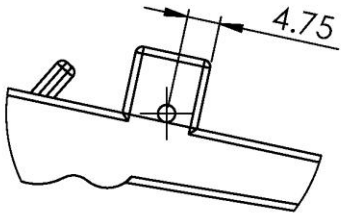


Pieces	Description	Item	Material	Dimension	Remarks
1	Hexagon Thin Nut ISO - 4035 - M2 - N	11.6			Purchased
1	ISO 7045 - M2 x 20 - Z --- 20N	11.5			Purchased
1	2 pin Rcy Socket male	11.4			Purchased
1	Switch Wire	11.3			Purchased
1	Micro Limit Switch with roller	11.2			Purchased
1	HANDLE	11.1			6741-11-1

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material :	
	Checked by :	Sign. :	
	A4	Sprayer Handle Assy	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-11
Origin.	Rep.	Rep.by.	SN. NS.



SECTION AA-AA



DETAIL AB
SCALE 1 : 1

Revision Index	Drawn by : Gregorius Widyo	Scale : 1:2	
	Reg. Nr. :	Unit : mm	
	Date : 7/5/2013	Material : Std sprayer handle	
	Checked by :	Sign. :	
	A4	Sprayer Handle	
INDUSTRIAL ENGINEERING UAJY		Operation	Dwg. Nr. 6741-11-1
Origin.	Rep.	Rep.by.	SN. NS.

WEBBING
Polypropylene & Polyester

POLYPROPYLENE WEBBING
This low-cost versatile webbing has a variety of applications in the boat, sail, marquee, covers, canvas, and other industrial markets. A standard range of colours is available from stock; other colours are available upon a 'make to order' basis.

Size (mm)	Product Code	Strength (Kg)	Metres Per Roll	PRICE Per Roll
Plain Weave				
12	PPWP012050	290	50	£5.21
20	PPWP020050	510	50	£6.44
25	PPWP025050	550	50	£7.67
40	PPWP040050	750	50	£14.44
50	PPWP050050	1100	50	£15.68
75	PPWP075050	1250	50	£22.76
Herringbone Weave				
20	PPWH020050	215	50	£3.98
25	PPWH025050	435	50	£6.44
40	PPWH040050	600	50	£12.86
50	PPWH050050	875	50	£14.44
75	PPWH075050	960	50	£22.76

The strength of coloured webbing is up to 50% lower than the black & white products.

Colour Data Table

WEAVE	WIDTH	White	Yellow	Red	Wine	Blue	Navy	Olive	Green	Grey	Black
PLAIN	12 mm	•									•
	20 mm	•	•	•		•		•	•		•
	25 mm	•	•	•	•	•	•	•	•	•	•
	40 mm	•									•
	50 mm	•	•	•	•	•	•	•	•	•	•
H/Bone	20 mm	•				•				•	•
	25 mm	•		•			•				•
	40 mm	•									•
	50 mm	•	•	•	•	•			•		•

POLYESTER WEBBING
A range of quality Polyester webbings giving high UV resistance and dyed for colour retention in exposed conditions. Designed with sail and cover makers in mind, this webbing also has many uses in the tent and marquee industries.

Size (mm)	Product Code	Strength (Kg)	Metres Per Roll	PRICE Per Roll Natural	PRICE Per Roll Black	PRICE Per Roll Colours
Plain Weave						
20	PWP020050	750	50	£10.03	£11.14	
25	PWP025050	1000	50	£13.93	£15.59	£15.59
38	PWP038050	1500	50	£22.28		
50	PWP050050	2000	50	£26.74	£39.00	
Herringbone Weave						
13	PWH013050	400	50	£9.48	£10.03	
20	PWH020050	600	50	£8.35		
25	PWH025050	750	50	£10.03		£11.70
50	PWH050050	1500	50	£22.28		

The following colours are available from stock in the qualities indicated:

Please enquire for non-stocked sizes and colours. Minimums will apply.

Colour Data Table

WIDTH	Yellow	Dark Red	Navy	Green	Black
PWP020					•
PWP025	•	•	•	•	•
PWP050					•
PWH013/25					•

E-mail: sales@ptwinchester.co.uk www.ptwinchester.co.uk

Tabs, Locks & Slides	Product Code	Description	Size (Priced Individually)						
			16mm	20mm	25mm	30mm	38mm	50mm	One Size
	FAC201	Tri-Slide White Or Black in 50mm - otherwise Black.		7p	8p	9p	10p	12p	
	FAC202	Wide Tri-Slide			8p				
	FAC203	Wide Tri-Slide						12p	
	FAC300	Triangle			8p				
	FAC302	Standard D-Ring Black (White Or Black available in 20/25mm)		7p	7p		9p	11p	
	FAC303	Heavy Duty D-Ring			8p	9p	10p	11p	
	FAC305	Hexagon Ring			8p			11p	
	FAC401	Retangle Loop Black - (White Or Black available in 25mm)		7p			9p		
	FAC403	Rectangle Loop			8p		9p	10p	
	FAC404	Wide Rectangle Loop			8p		9p	11p	

All Prices are Pence Per Each Item - Only Sold In Lots of 100

E-mail: sales@ptwinchester.co.uk www.ptwinchester.co.uk

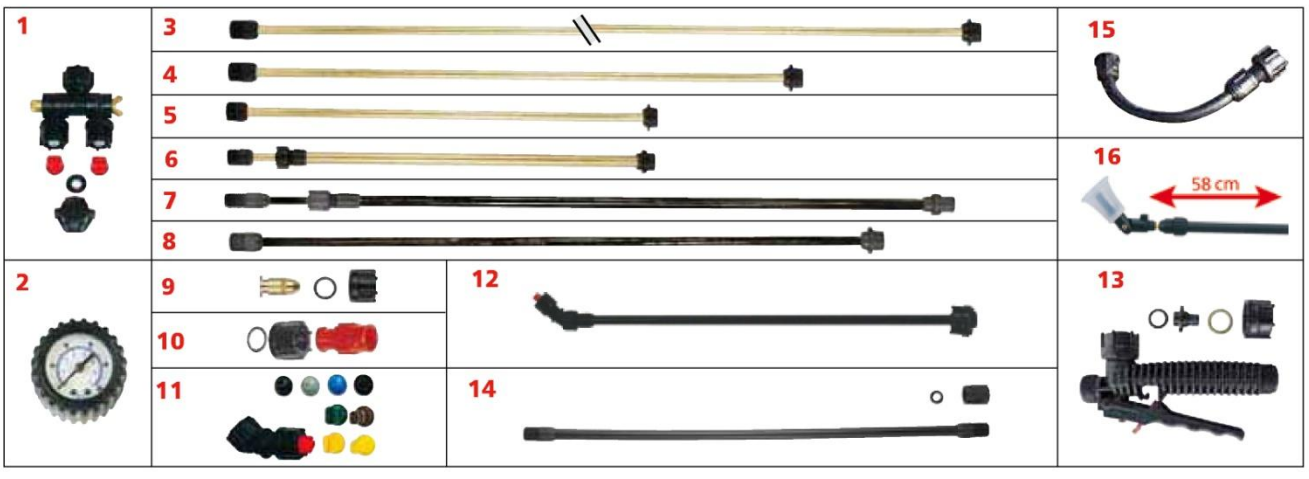
PLASTIC FITTINGS

Side Release Buckles	Product Code	Description	SIZE AVAILABILITY (Priced Individually)						
			16mm	20mm	25mm	30mm	38mm	50mm	One Size
	FAC500	-Curved Single Adjustable Black - Black Or White available in 25/50mm	18p		31p		39p	55p	
	FAC500	-Curved, Dual Adjust						71p	
	FAC501	-Standard		15p	23p		39p	55p	
	FAC501D	-Dual		17p	25p		41p	57p	
	FAC504	-Standard			19p				
	FAC505	Centre Release			19p				
	FAC509	Centre Release			32p				
	FAC601	Press Buckle Black Or White available		15p	21p		58p	65p	
Webbing and Strap Locks									
	FAC600	Step Lock			9p		18p		
	FAC602	Step Lock Black Or White available	7p	8p	9p		12p		

All Prices are Pence Per Each Item - Only Sold In Lots of 100

Sprayer accessories

Pos.	Description	Part no.	456/457	461/462/463	425/473P	435	475/473D	485	432	416
1	**Dual nozzle with nozzle set** Two swivelling nozzles for simultaneous spraying of two rows of plants. Versatile nozzle use.	49 00 477	●	●	●	●	●	●	●	●
2	**Pressure gauge 10 bar with connection parts** For spray pressure control. The spray medium can be accurately applied with the required pressure.	49 00 356	●	●	●	●	●	●	●	●
3	**Tree spraying tube, two-part,** brass, 150 cm. For increased reach, e.g. for espaliered trees, high shrubs, etc.	49 00 528	●	●	●	●	●	●	●	●
4	**Spray wand, brass,** 75 cm. Recommended for use with spray boom or drift guard near the ground.	49 00 428	●	●	●	●	●	●	●	●
5	**Spray wand, brass,** 50 cm. Comfortable working with spray boom.	49 00 519	●	●	●	●	●	●	●	●
6	**Telescopic spray wand** 57 – 100 cm. Universal application through individual adjustment of the spray wand length.	49 00 478	●	●	●	●	●	●	●	●
7	**Telescopic spray wand, carbon** 120 – 230 cm. Made from ultra-light carbon fibre for fatigue-free work in greater spray ranges, total weight only 120 g.	49 00 445	●	●	●	●	●	●	●	●
	Telescopic spray wand 60 – 120 cm, 75 g.	49 00 457	●	●	●	●	●	●	●	●
8	**Tree spraying tube, carbon,** 120 cm. Total weight only 60 g. Made from ultra-light carbon fibre for lighter work.	49 00 449	●	●	●	●	●	●	●	●
9	**High reach nozzle, brass** Adjusts from fine mist to long jet, e.g. enables pin-point accurate application over a greater distance.	49 00 206	●	●	●	●	●	●	●	●
10	**High reach nozzle, plastic** Adjusts from fine mist to wide jet.	49 00 525	●	●	●	●	●	●	●	●
11	Nozzle set comprising **8 nozzles** Universal application.	49 00 448	●	●	●	●	●	●	●	●
12	**Spray tube PVC** 50 cm, with flat jet nozzle. Universal spray wand made from almost unbreakable special plastic.	49 00 439	●	●	●	●	●	●	●	●
13	**Manual valve** Manual valve for professional use with pressure gauge connection, child-proof lock and continuous use.	49 00 440	●	●	●	●	●	●	●	●
14	**Spray wand,** brass, 50 cm. For increased range.	49 00 513	●	●	●	●	●	●	●	●
15	**Spray wand extension, flexible,** 15 cm. Up to 180°, flexibility for individual plant protection and cleaning operations.	49 00 450	●	●	●	●	●	●	●	●
16	**Telescopic wand,** approx. 25 – 50 cm. Extension for manual sprayers 401/402 for more comfortable work near the ground and overhead.	49 00 628	-	-	-	-	-	-	-	-



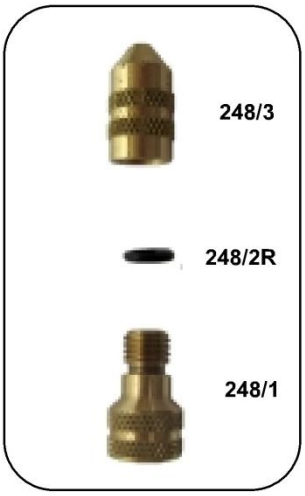
OPTIONAL SPRAYING ACCESSORIES

FAN NOZZLE

MB/48F
Fan Cap Nozzle

Spraying Pattern : Fan
Type : Standard Fan Nozzle
Feature/Usage : Used for applying pesticides to relatively flat surfaces, such as soil surface treatment as they can distribute pesticide across a swath
Material : Brass
Orifices : 1/32", 3/64", 1/16", 5/64", 3/32", 7/64"
Thread : 22G

248
Adjustable Fan Jet Nozzle Cpt.



Parts of 248

Spraying Pattern : Fan
Type : Adjustable Fan Nozzle
Feature/Usage : - Can be adjusted to get a suitable spray angle
- Used for applying pesticides to relatively flat surfaces, such as soil surface treatment as they can distribute pesticide across a swath
Material : Brass
Orifices : 1/32", 3/64", 1/16", 5/64", 3/32", 7/64"
Thread : 22G

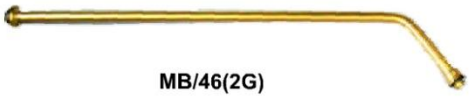
SYKT. JUN CHONG SDN. BHD.

OPTIONAL SPRAYING ACCESSORIES

SPRAYING LANCE

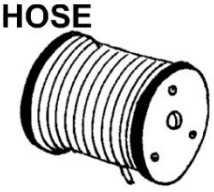
Usage:

- To reach the target
- To keep the distance of nozzle away from operator in order to avoid contamination.
- Various Lengths of lance

TYPE	DESCRIPTION
 **MB/46** **Brass Spraying Lance**	Type : Spraying Lance Feature/Usage : Can use together with elbow lance to get effectiveness in spraying. Material : Brass Length : 18", 20", 24", 30", 36", 42", 48", 60", 72", 84", 96"
 **MB/46(2G)** **Spraying Lance With Goose**	Type : Spraying Lance Feature/Usage : To reach target effectively. Material : Brass Length : 18", 20", 24", 30", 36", 42", 48", 60", 72", 84", 96"
 **MB/46 (AL)** **Aluminum Spraying Lance**	Type : Spraying Lance Feature/Usage : Lighter than brass spray lance, can adapt with elbow lance to get effective spraying . Material : Aluminum Length : 18", 20", 24", 30", 36", 42", 48", 60", 72", 84", 96"

SYKT. JUN CHONG SDN. BHD.

RED P.V.C. SPRAY HOSE



This hose is high quality specifically compounded synthetic cover and Tube. Will stand up to many agricultural spray solutions such as lasso, insecticides, and fungicides. Packed on mini reels.

PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE	FT. PER REEL
301-4408	1/4"	300	300
301-4412	3/8"	300	300
301-4416	1/2"	250	300
301-4420	5/8"	200	300
301-4424	3/4"	200	300
301-4432	1"	150	300

RED RUBBER SPRAY HOSE

Epdm solution agricultural spray hose for spraying pesticides, insecticides and fertilizers with a water base. Durable and long lasting epdm cover and tube have excellent resistance to sunlight, ozone, heat, chemical action and abrasion.

PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE	FT. PER REEL
301-1408	1/4"	200	750'
301-1412	3/8"	200	650'
301-1416	1/2"	200	500'
301-1420	5/8"	200	400'
301-1424	3/4"	200	350'
301-1432	1"	200	250'
301-1340	1-1/4"	200	250'
301-1348	1-1/2"	200	200'

HIGH PRESSURE AG-SPRAY HOSE

Ag spray is a chemical spray hose designed for medium and high pressure agriculture spraying. Features include: fuel and solvent resistant tubes increase service life and enables a wide range of chemicals to be used, tough abrasion-resistant outer cover for long life, flexible for ease of handling, wide temperature range-from 14° F to 140° F. Ideal for spray booms, pest control spray lines, orchard spraying, nursery, lawn and turf spraying, and chemical transfer.

PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE	FT PER REEL
301-4612	3/8"	600	300
301-4616	1/2"	600	300

EVA ANHYDROUS AMMONIA HOSE

PART NO.	SIZE I.D.	WORKING PRESSURE AT 70°
300-1312	3/8"	50
300-1316	1/2"	50

500 FEET PER ROLL - PRICED PER FT.

DISCHARGE HOSE

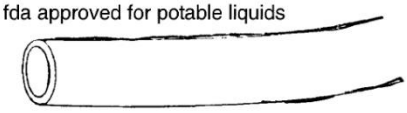
Lay flat design pvc lightweight and flexible. This hose is easy to roll and carry. Strong and weather proof will not absorb water, resistant to oils, greases, acids and many chemicals, abrasion, mildew and rot. Performance range is from 5 F to 125 F.

PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE	FT. PER REEL
301-6148	1-1/2"	85	300
301-6164	2"	70	300
301-6172	3"	85	300

CLEAR VINYL HOSE

Good resistance to oils, acids, alkalids and many solvents except for ethers, key tones and aromatic hydro carbons. Non-toxic fda approved for potable liquids



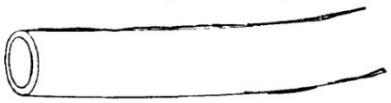
100 FEET PER ROLL
PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE	WALL THICKNESS
301-2708	1/4"	70	1/16"
301-2712	3/8"	65	1/8'
301-2716	1/2"	45	1/8"
301-2724	3/4"	35	1/8"
301-2732	1"	30	1/8"
301-2720	5/8"	30	1/8"

CLEAR VINYL HOSE

REINFORCED W/ POLYESTER YARN

To reduce elongation under pressure.



100 FEET PER ROLL
PRICED PER FT.

PART NO.	SIZE I.D.	WORKING PRESSURE AT 70°F	WORKING PRESSURE AT 122°F
301-4508	1/4"	250	150
301-4512	3/8"	225	125
301-4516	1/2"	200	100
301-4520	5/8"	200	100
301-4524	3/4"	150	85
301-4532	1"	125	75

HOSE CUTTER

Cuts all sizes up to 1 1/4" I.D. Polypropylene, polybutylene, pvc, abs, and rubber hose. Features a strong tough nylon handle with repleable stainless steel blades. Li'l nipper cutters are easily carried. The cutters are light and can be handily carried in the back pocket or tool pouch. Ideal in limited working space, such as down a trench, close to a ceiling or wall etc.

PART NO.	DESCRIPTION
456-241	COMPLETE TOOL
456-242	REPLACEMENT BLADES (2)

Brass Needle & Humidifier Valves

Product Applications

- For use on instrumentation, hydraulic and pneumatic systems.
- Designed for automotive or industrial use. Not intended for natural gas, LPG, nuclear or aircraft applications.

Product Advantages

- BrassCraft® Needle Valves have metal-to-metal seats with fine thread adjustment.
- Provide positive sealing and flow adjustment up to the capacity of the valve.
- Backed by BrassCraft Mfg.'s 65 plus year history and reputation for quality and service.

How to Order

- Order valves by part number and product name.

Special Orders

- Special fitting configurations and sizes may be ordered. Please furnish a print or sketch of your needs with your inquiry
- Fittings are available in bulk quantities on request. Contact your sales representative for details.

Assembly Instructions

- Install with pressure against seat.
- Inspection of straight valve shows one opening is higher than the others.
- Pressure should always be directed against the seat in angle valves, not the stem threads.

PART NO.	USE	UPC	DESCRIPTION	FINISH	QTY	LBS
Cooler Adaptors						
CA-44	○	026613078212	1/2" FIP x 1/2" MIP w/ 1/8" FIP Side Outlet	Rough	25	3.1
CA-45	○	026613078229	3/4" FIP x 3/4" MIP w/ 1/8" FIP Side Outlet	Rough	25	5.5
Cooler Drains						
CD-1	○	026613051284	3/4" Male Hose Thread x 1/2" FIP	Rough	25	2.8
Humidifier Valves - Ice Maker Kit						
NV104-EE1 K1	○	026613078519	3/8" OD Comp x 3/8" OD Comp w/ 1/4" OD Comp	Rough	100	16.9
NV104-EE1X K1	▲	026613153223	3/8" OD Comp x 3/8" OD Comp w/1/4" OD Comp	Rough	100	16.9
Compression Needle Valves						
NV105-3	○	026613078526	3/16" OD Comp, Both Ends	Rough	25	2.1
NV105-4	○	026613078533	1/4" OD Comp, Both Ends	Rough	25	2.2
NV105-4X	▲	026613137490	1/4" OD Comp, Both Ends	Rough	25	2.2
NV105-6	○	026613078557	3/8" OD Comp, Both Ends	Rough	25	3.3
NV105-6X	▲	026613137483	3/8" OD Comp, Both Ends	Rough	25	3.1
NEV-NCV	○	026613078304	For 3/8" to 1" OD Tube w/ 1/4" OD Comp - Incl. Saddle Clamp, (2) Nuts, Bolts & Washers	Rough	100	24.2

○ Not for use in potable water applications.
▲ Certified Compliant to NSF/ANSI 372 for potable water applications

BrassCraft®

HOSE BARB

Female Hose Barb Adaptors (cont.)

PART NO.	USE	UPC	DESCRIPTION	FINISH	QTY	LBS
126-6-8	○	026613084855	3/8" ID Hose Barb x 1/2" FIP	Rough	25	3.5
126-8-4	○	026613084879	1/2" ID Hose Barb x 1/4" FIP	Rough	10	0.6
126-8-6	○	026613084886	1/2" ID Hose Barb x 3/8" FIP	Rough	25	2.6
126-8-8	○	026613012308	1/2" ID Hose Barb x 1/2" FIP	Rough	25	4.1
126-8-8X	▲	026613146737	1/2" ID Hose Barb x 1/2" FIP	Rough	25	4.1
126-12-12	○	026613084725	3/4" ID Hose Barb x 3/4" FIP	Rough	10	2.3

Male Hose Barb Adaptors

125-2-2	○	026613082530	1/8" ID Hose Barb x 1/8" MIP	Rough	25	0.5
125-2-2X	▲	026613146416	1/8" ID Hose Barb x 1/8" MIP	Rough	25	0.5
125-2-4	○	026613084435	1/8" ID Hose Barb x 1/4" MIP	Rough	10	0.3
125-2-4X	▲	026613146430	1/8" ID Hose Barb x 1/4" MIP	Rough	10	0.3
125-3-2	○	026613088228	3/16" ID Hose Barb x 1/8" MIP	Rough	10	0.3
125-3-2X	▲	026613146447	3/16" ID Hose Barb x 1/8" MIP	Rough	10	0.2
125-3-4	○	026613084459	3/16" ID Hose Barb x 1/4" MIP	Rough	10	0.3
125-3-4X	▲	026613146461	3/16" ID Hose Barb x 1/4" MIP	Rough	10	0.3
125-4-2	○	026613082400	1/4" ID Hose Barb x 1/8" MIP	Rough	25	0.6
125-4-2X	▲	026613146478	1/4" ID Hose Barb x 1/8" MIP	Rough	25	0.6
125-4-4	○	026613003818	1/4" ID Hose Barb x 1/4" MIP	Rough	25	0.9
125-4-4X	▲	026613146492	1/4" ID Hose Barb x 1/4" MIP	Rough	25	0.9
125-4-6	○	026613082417	1/4" ID Hose Barb x 3/8" MIP	Rough	25	1.3
125-4-6X	▲	026613146515	1/4" ID Hose Barb x 3/8" MIP	Rough	25	1.3
125-4-8	○	026613084510	1/4" ID Hose Barb x 1/2" MIP	Rough	10	0.9
125-4-8X	▲	026613146522	1/4" ID Hose Barb x 1/2" MIP	Rough	10	0.9
125-5-2	○	026613084527	5/16" ID Hose Barb x 1/8" MIP	Rough	10	0.3
125-5-2X	▲	026613146539	5/16" ID Hose Barb x 1/8" MIP	Rough	10	0.3
125-5-4	○	026613082486	5/16" ID Hose Barb x 1/4" MIP	Rough	10	0.4
125-5-4X	▲	026613146546	5/16" ID Hose Barb x 1/4" MIP	Rough	10	0.4
125-5-6	○	026613084558	5/16" ID Hose Barb x 3/8" MIP	Rough	10	0.6
125-6-2	○	026613082615	3/8" ID Hose Barb x 1/8" MIP	Rough	25	1.0
125-6-2X	▲	026613146553	3/8" ID Hose Barb x 1/8" MIP	Rough	25	1.0
125-6-4	○	026613082394	3/8" ID Hose Barb x 1/4" MIP	Rough	25	1.0
125-6-4X	▲	026613146577	3/8" ID Hose Barb x 1/4" MIP	Rough	25	1.0
125-6-6	○	026613003825	3/8" ID Hose Barb x 3/8" MIP	Rough	25	1.6
125-6-6X	▲	026613146607	3/8" ID Hose Barb x 3/8" MIP	Rough	25	1.6
125-6-8	○	026613053738	3/8" ID Hose Barb x 1/2" MIP	Rough	25	2.4
125-6-8X	▲	026613146638	3/8" ID Hose Barb x 1/2" MIP	Rough	25	2.4
125-8-4	○	026613082523	1/2" ID Hose Barb x 1/4" MIP	Rough	25	1.4
125-8-4X	▲	026613146645	1/2" ID Hose Barb x 1/4" MIP	Rough	25	1.4
125-8-6	○	026613082448	1/2" ID Hose Barb x 3/8" MIP	Rough	25	1.8
125-8-6X	▲	026613146652	1/2" ID Hose Barb x 3/8" MIP	Rough	25	1.8
125-8-8	○	026613084688	1/2" ID Hose Barb x 1/2" MIP	Rough	25	2.7
125-8-8X	▲	026613146669	1/2" ID Hose Barb x 1/2" MIP	Rough	25	2.7
125-8-12	○	026613082509	1/2" ID Hose Barb x 3/4" MIP	Rough	25	3.7

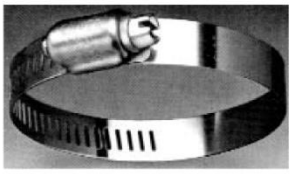
○ Not for use in potable water applications.
▲ Certified Compliant to NSF/ANSI 372 for potable water applications

HOSE CLAMPS

STANDARD CLAMPS

9/16" BAND 5/16" HEX HEAD SCREW WITH SLOT

PRICED EACH - PACKAGED 10 PER CARTON



PART NO.	MIN.	MAX.
316-6	7/16"	25/32"
316-8	7/16"	29/32"
316-10	9/16"	1-1/16"
316-12	11/16"	1-1/4"
316-16	3/4"	1-1/2"
316-20	13/16"	1-3/4"
316-24	1-1/16"	2"
316-28	1-5/16"	2-1/4"
316-32	1-9/16"	2-1/2"
316-36	1-13/16"	2-3/4"
316-40	2-1/16"	3"
316-44	2-5/16"	3-1/4"
316-48	2-9/16"	3-1/2"
316-52	2-13/16"	3-3/4"
316-56	3-1/16"	4"
316-60	3-5/16"	4-1/4"

MINI CLAMPS

5/16" BAND 1/4" HEX HEAD SCREW WITH SLOT

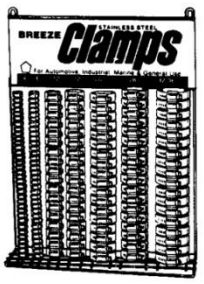
CLAMPS ARE MANUFACTURED OF STAINLESS STEEL- BAND AND HOUSING WITH HARDENED ZINC PLATED ADJUSTING SCREW.

PRICED EACH - PACKAGED 10 PER CARTON

PART NO. 316-104	**MIN:** **MAX:**	1/4" 5/8"
PART NO. 316-106	**MIN:** **MAX:**	5/16" 29/32"

HOSE CLAMP MERCHANDISER

Hang it on the wall or stand it on the counter.
Conveniently displays popular clamp sizes for impulse sales and easy inventory. Use for compressing, fastening, clamping, repairing. Clamps to fit any hose, pipe or tubing from 1/4" to 2-3/4" O.D.



Tightens firmly.
Holds permanently.
Exerts even pressure.

PART NO.	DESCRIPTION
316-1	Clamp Display (with clamps)
316-101	Clamp Display only (empty)

Rectangular Multipole - continued

0.140 Mate-N-Lok - continued

386394

No. of Ways	Mftrs. List No.	Order Code	Price Each 5+	10+	100+	250+
Plug Housing -Free						
2	1-350345-0	**857-8095**	0.923	0.634	0.522	0.469
3	1-350347-0	**857-8117**	0.842	0.675	0.611	0.488
9	1-480586-0	**857-8133**	3.070	2.410	2.160	1.810
Receptacle Housing -Free						
2	1-350344-0	**857-8109**	0.923	0.634	0.522	0.460
3	1-350346-0	**857-8125**	1.240	0.959	0.926	0.777
9	1-480585-0	**857-8141**	3.170	2.480	1.820	1.520
Receptacle Housing -Panel						
9	1-480672-0	**857-8168**	2.350	1.610	1.340	1.120

	Material	Mftrs. List No.	Order Code	Price Each 10+	50+	100+	250+
Pin Contacts							
14-20AWG	Copper Alloy	925660-1	**857-8192**	0.519	0.375	0.282	0.226
14-20AWG	Phosphor Bronze	925660-2	**124-8267**	0.752	0.684	0.651	0.628
10-14AWG	Copper Alloy	925662-1	**857-8214**	0.572	0.430	0.392	0.339
10-14AWG	Phosphor Bronze	925662-2	**124-8269**	0.615	0.566	0.530	0.509
Socket Contacts							
14-20AWG	Brass	925661-1	**857-8206**	0.477	0.346	0.258	0.207
14-20AWG	Phosphor Bronze	925661-2	**124-8268**	0.700	0.654	0.619	0.595
10-14AWG	Brass	925663-1	**857-8222**	0.465	0.370	0.328	0.274
Tooling							
Hand Tool		825582-2	**359-798**	300.000			
Die for Pro-Crimper		1752938-2	**857-8230**	495.680			

Four Way (5¼"/3" Drives)

Tyco Electronics

A four way power connector that mates with most popular 5¼" and 3" standard disk drive units. To facilitate extension cable to be made up, a four way PCB mounting header is also available.

Pin housing | Socket housing | Socket contact | PCB pin header PCB mounting centres 4 x 1.78 dia, 5.08 (0.2") Pitch

Contacts Phosphor bronze, tin plated
PCB contacts Brass, tin plated
Wire size 20-18 SWG (0.5-1.0mm²)
Insulation dia. 1.8 - 3.3

FOR THE COMPLETE RANGE OF COMMERCIAL 'MATE-N-LOK' CONNECTORS SEE WEB SITE.

Mftrs. List No: 1-480426-0 = 299-479, 1-480424-0 = 148-085, 350211-1 = 148-086, 163305-2 = 105-6036, 163304-2 = 149-090/1

208980

4 Way Housings	Order Code	Price Each 1+	25+	100+	500+
Pin	**299-479**	0.747	0.597	0.423	0.357
Socket	**148-085**	0.634	0.503	0.356	0.301
PCB header	**148-086**	1.850	1.470	1.310	1.120

Contacts	Order Code	Price Per Pack 1+	5+	10+	25+
Pin (pack of 100)	**105-6036**	49.120	46.960	43.840	38.870
Socket (pack of 10)	**149-090**	5.650	5.390	5.100	4.660
Socket (pack of 100)	**149-091**	48.860	46.690	43.570	38.740

Four Way (3" Drives)

Tyco Electronics

A four way power connector that mates with TEAC and most popular 3½" standard disk drive units.

Socket housing | Socket contact

Contacts Brass, tin plated
Housing Nylon 6.6 **UL94V-0** and **CSA**
Wire size 0.14 — 0.52mm², 20-26AWG
Insulation dia. 1.1, 1.9

Mftrs. List No. 171822-4=150-665, 170204-1=150-666

208981

	Order Code	Price Each 1+	25+	100+	500+	+
Housing	**150-665**	0.573	0.425	0.341	0.265	– –

Contacts	Order Code	Price Per Pack 1+
Socket (pack of 10)	**150-666**	5.040

Tooling for Disk Drive Power Connectors

Tyco Electronics

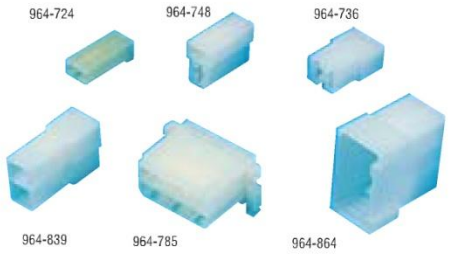
Mftrs. List No. 455822-2=148-089, 465644-1=148-090

209031

	Mftrs. List No.	Order Code	Price Each 1+
Extraction Tool (6 way)	455822-2	**148-089**	29.10
Extraction Tool (4 way)	465644-1	**148-090**	69.60

'Fastin-Faston'

Tyco Electronics



- Multi-position, wire harness coupling connector
- Locking lance on contacts for firm retention in housing
- 1 through to 11 way

Housing Polyamide 6.6 **UL94V-2**
Contacts Brass, tin plated
Temperature 105°C

209213

No. of Ways	Mftrs. List No.	Order Code	Price Each 5+	10+	100+	250+
Receptacle Housing						
1	925324-2	**964-724**	0.261	0.207	0.150	0.139
2	180923	**964-736**	0.593	0.470	0.339	0.313
2	180907	**964-748**	0.529	0.419	0.302	0.280
3	180941	**964-750**	0.576	0.459	0.327	0.305
4	180900	**964-761**	0.673	0.534	0.384	0.356
6	180904	**964-785**	0.775	0.700	0.679	0.624
8	163007	**964-797**	1.200	1.100	1.070	0.983
11	151325-1	**964-803**	4.490	4.110	3.760	3.320
Tab Housing						
1	180916	**964-815**	0.359	0.285	0.203	0.191
2	180924	**964-827**	0.558	0.441	0.315	0.296
2	180908	**964-839**	0.916	0.809	0.757	0.664
3	180940	**964-840**	0.579	0.459	0.329	0.306
4	180901	**964-852**	0.756	0.597	0.429	0.400
6	180906	**964-864**	1.350	1.210	1.150	1.090
8	163008	**964-876**	2.490	2.270	2.180	2.020
11	151326-1	**964-888**	4.900	4.430	4.050	3.620

Crimp Terminals for 'Fastin-Faston'

Tyco Electronics

Contact Brass, Tin plated

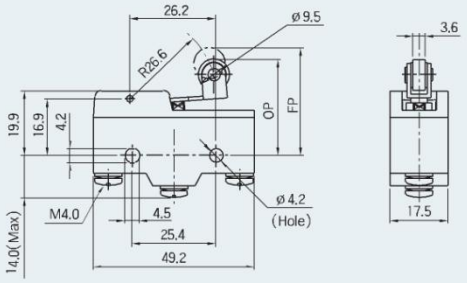
	Wire Size (mm²)	Insulation Diameter	Mftrs. List No.	Order Code
Receptacles	0.3-0.8	2.2-3.2	60838-1	964-890
Receptacles	0.8-2.1	3.1-4.1	42238-2	964-906
Receptacles	0.8-2.1	3.1-4.1	42282-2	964-918
Tabs	0.3-0.8	2.2-3.1	61316-1	964-920
Tabs	0.8-2.1	3.1-4.1	42241-2	964-931
Tabs	0.8-2.1	3.1-4.1	42565-2	964-943

209212

Shape / Dimension Drawing

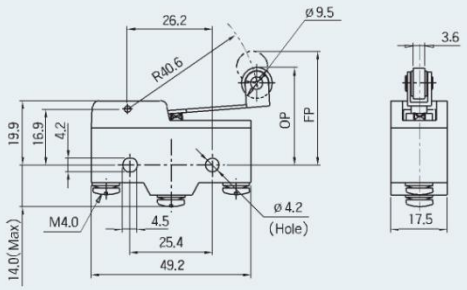
(unit : mm)

YSR 1015 GW-B



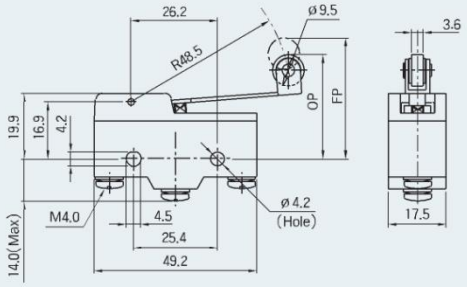
OF (max.)	160gf
RF (min.)	80gf
OT (min.)	3mm
MD (max.)	1.2mm
FP (max.)	32.9mm
OP	29.4 ±0.8

YSR 1115 GW-B



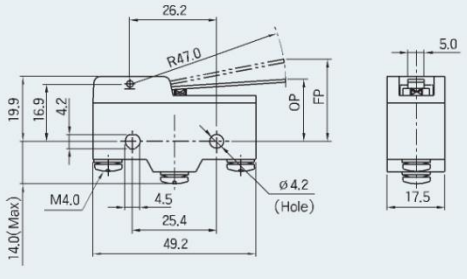
OF (max.)	120gf
RF (min.)	50gf
OT (min.)	6mm
MD (max.)	2mm
FP (max.)	35.0mm
OP	30.0 ±0.8

YSR 1215 GW-B



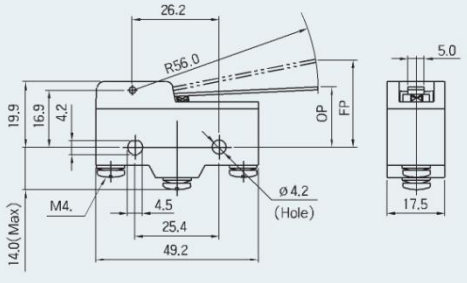
OF (max.)	90gf
RF (min.)	40gf
OT (min.)	6mm
MD (max.)	2.4mm
FP (max.)	36.5mm
OP	30.2 ±1.0

YSL 2015 GW-B



OF (max.)	95gf
RF (min.)	50gf
OT (min.)	2mm
MD (max.)	2mm
FP (max.)	24.8mm
OP	18.8 ±0.8

YSL 2115 GW-B



OF (max.)	90gf
RF (min.)	40gf
OT (min.)	8mm
MD (max.)	3mm
FP (max.)	26.4mm
OP	18.4 ±0.8

SUKU CADANG SPRAYER

Katalog Produk

(Gambar)

Sabuk Sprayer

ambarisetiawan@yahoo.co.id

Harga:	**Rp. 8.625**
Kemas & Pengiriman:	**Plastik**
Negara Asal:	**Indonesia**
Keterangan:	**Sabuk Sprayer dalam kemasan plastik, dari pabrikan.**

SUKU CADANG SPRAYER

Katalog Produk

Share
Like 0

(Gambar)

Slang Sprayer

ambarisetiawan@yahoo.co.id

Harga:	**Rp. 12.350**
Cara Pembayaran:	**Transfer Bank (T/T)**
Kemas & Pengiriman:	**Plastik**
Negara Asal:	**Indonesia**
Keterangan:	**Slang Sprayer lengkap dengan Dratnya dalam kemasan plastik.**